

The University of Chicago

BUSINESS BEHAVIOR, 1919-1922

An Account of Post-war Inflation and Depression

A DISSERTATION SUBMITTED TO THE FACULTY
OF THE SCHOOL OF BUSINESS IN CANDIDACY
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

1942

By
WILSON F. PAYNE

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PREFACE

IT IS a pleasure to record my indebtedness to those who have aided me in the preparation of this study. I should like to thank Mr. Charles A. Bliss, formerly of the National Bureau of Economic Research, New York, for kindly making available to me the vast collection of statistical series in the Bureau's files; also Mr. Arthur F. Burns of the research staff for discussing with me the possible methods and objectives of my work. Thanks are also due to Mr. Woodlief Thomas, assistant director of the Division of Research and Statistics, Board of Governors of the Federal Reserve System, for granting me the use of the worksheets for unpublished employment indices for certain industries; and to Mr. John O. Bergelin and Mr. Maxwell R. Conklin for their care in explaining them to me. Mr. Isador Lubin, Commissioner of Labor Statistics, United States Department of Labor, also gave me access to some early employment figures.

I am indebted to Mr. Edward H. Redstone of the Boston Public Library for allowing me extensive privileges in the use of periodical literature. Mr. Arthur H. Cole, librarian of the Baker Library, Graduate School of Business Administration, Harvard University, generously made the facilities of that library constantly available to me. The Harvard Bureau of Business Research let me use certain unpublished and out of print material relating to cotton textiles. A special mark of gratitude is due Miss Ver Noy and Mrs. Pietsch of the Harper Library, University of Chicago, for their unfailing aid. The graphs are the work of many hands, principally—in addition to my own—those of William Hertzog, Chester Payne, and Miss Mary Stearns, chartist for the Babson Statistical Organization.

The incalculable aid given by my wife, Dr. Elizabeth Rogers Payne, escapes definition. Over the years consumed by this study she has not only sacrificed many of her own interests to keep interruptions at a minimum but has also criticized and typed the entire manuscript.

Finally, I am honored in the acknowledgment of my greatest debt—that due to Professor Garfield V. Cox, of the University of Chicago. This is not the debt one owes for casual kindness from the director of a dissertation; it is the far deeper gratitude one feels for leadership in one's earliest interest in his field and for the constant encouragement and helpfulness which have made that interest enduring.

WILSON F. PAYNE

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June 1942

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CHAPTER I

INTRODUCTION

THIS study is an account of American business experiences in the years immediately following World War I. The general objective has been to trace the process, the intimate chain of circumstances, by which American business progressed from a small post-war recession (*ca.* March, 1919) to one of its greatest booms, thence to one of its most suffocating collapses (*ca.* January, 1921), and finally to the recovery which set the stage for the most productive decade it had ever known.

Any attempt to enlarge our knowledge by reference to the past brings one up sharply against the problem of historical perspective. This problem has become progressively acute with the multiplication of records. Until comparatively recent times the paucity of records permitted little more than successive repetition of political and military matters. Now, however, the task of the student of his own times has become extremely burdensome. The necessity of selecting data from the vast welter of recorded experience has brought the student's personal viewpoint, his predisposing attitudes, more prominently into the historical narrative and produced an increasing number of variations in the interpretation of historical experience. Scholars with different hypotheses of the moving forces in human affairs inevitably tend to confine their attention to the kinds of information which their theories make relevant.

To the student of business history the problem of perspective is intensively vexatious, for he is confronted with many theories of what makes business fluctuate between prosperity and depression. Presumably, no one seriously offers a theory for which he finds no historical confirmation. Yet many of the theories are contradictory. For this impasse a very discouraging explanation suggests itself. Can it be that the sponsors of the various theories do not even agree upon the data of experience? Perhaps each sees

a different aspect of a historical period, sees only that portion of the total experience which his theory makes important. When one has set up a hypothesis, he has, in that act, determined what kind of data is important; the material on which he concentrates thereafter is limited to that made relevant by the hypothesis. And the more refined the hypothesis, the more specialized the set of facts which is relevant. Thus it may not be strange that business-cycle students' pictures of historical experience do not coincide. The trouble is not that the students read the facts of history differently; it is that they do not read the same set of facts.

The dilemma is especially burdensome for the student who undertakes a study of the business experience of a certain period. If he begins with a hypothesis, he runs the risk of ignoring events thereby made irrelevant but which may, nevertheless, be important antecedents to change. On the other hand, without the stabilizing aid of a theory of causation, he has no predetermined scale for evaluating events. The dilemma may be avoided only by assuming that at present no one theory encompasses a wide enough range of human experience to explain why men alter their views of the future. With this assumption we are left free to proceed along empirical lines. In this study we shall merely set up a grid for catching a wide range of kinds of information and explain business situations where and as they are found and in terms, not of some one business-cycle theory as it may momentarily apply, but in terms of whatever appears to have been the prime moving force in each instance.

Of course, even with this method of approach the predispositions of the observer are bound to enter, placing in his hands the peculiar scales with which he will weigh and evaluate events. This is an ineradicable fault. It may be ameliorated somewhat by the use of a system of reporting that may be depended upon to pick up a wide assortment of information and to place it, coherently, at the point in the narrative where it deserves consideration. What use is made of it at that point, the weight given it, the moving force attributed to it—of this the reader must beware.

With this brief description of the kind of problem faced by the

student of historical business experience, we may now discuss our specific methods of procedure for the study at hand.

The basic plan of this investigation is relatively simple. It is a survey of the experiences of individual industries between the end of World War I and May, 1922. For our purpose an industry extends from the producer of raw materials to the consumer of the finished product and embraces all the functional business activities usually involved in such a chain of enterprises. The industries selected for study are: *leather and shoes*, including production of raw hides, tanning, shoe manufacture, wholesale marketing, retail marketing; *cotton*, including raw cotton, cotton yarn, cotton manufactures, cutting-up trades; *wool*, including raw wool, yarns, woolen and worsted goods, men's clothing, women's clothing; *silk*, including raw silk, thrown silk, broad silk, converters, knit goods, hosiery; *iron and steel* and their products, including coal and coke, pig iron, steel production, rolled-steel products and their principal users (shipbuilding, car and locomotive building, automobiles, oil production, machine tools, agricultural implements, building and construction).¹ It will be noted that our list of industries is confined to a representation of those of which short industrial depressions are peculiarly composed, viz., industrial products and postponable consumers' goods. Excluded, therefore, are the food industries and agriculture (as a producing community). We shall take up, in turn, each integral segment of each industry as listed above (e.g., in the leather and shoe industry—hides, tanning, shoe manufacture, the wholesale and retail shoe markets), tracing the experience of each segment throughout the period with special concern for matters which determine its market and keeping in mind, meanwhile, its intimate dependence upon the other segments of the industry.

Since no market in a pecuniary society is free from the financial environment which at times constitutes its major conditioning influence, it is apparent that no full understanding of the tides of business during this violent period is possible without a thorough knowledge of its financial setting. Wherever the force of

¹ See pp. 170-73 for a fuller, diagrammatic schedule of the steel-using industries included.

financial developments can be detected in individual markets, it is carefully reported in the chapters on the individual industries. But the monetary picture cannot be presented adequately in scattered fragments appended to the various market discussions, and we shall therefore begin our study with several chapters devoted to the financial situation alone.

Our analysis requires a wide variety of information, of which one fundamental type may be called quantitative. This type consists of monthly series which report such basic data as new orders, unfilled orders, production, shipments, stocks or inventories, sales, prices, etc., for each integral segment of an industry. These statistical series are presented in graphs at the ends of the sections to which they apply. All series have been graphed on identical logarithmic scales and are, therefore, directly comparable throughout the study. A considerable portion of our attention has gone to the collection and treatment of the statistical series because they reveal, in bald, uncompromising force, the basic outlines of the business experience with which we are concerned. The graphs are meant to be read, and the information which they inherently convey will not, except in special instances, be repeated in the text.

The depression of 1920-21 is, surprisingly, the first major depression for which there are sufficient statistical data to permit a study of this sort to be made. But, while the statistical data provide vitally important information of a certain kind about the experiences of an industry, they do not provide all the kinds of information we need. We must depend also upon the accounts of specialized market reporters in trade journals, trade-journal editorials and news reports of interest to the trade, and upon government reports such as investigations, routine surveys, etc. It is only from such verbal, qualitative accounts that we can learn, in so many words, what actual market situations underlay the behavior of the statistical series.

The method of approach which has been outlined permits us an important subsidiary objective: to report the specific responses which specific groups of businessmen have made in the presence of specific market stimuli. Certainly, one of the most

pressing problems of business-cycle theory is the problem of why men change their minds. It is probably not too much to say that within an industry the chain of markets from raw material to consumer is the locus of entrepreneurial effort. If the responses of businessmen are to be found at all, it is likely that they may be observed in the series of markets which separate the manufacturing (and other functional) stages of a specific industry. Whether the market is something to which men respond or is itself the collective response of men to various stimuli we are not obliged to decide here. The industry-analysis approach helps us to find out what these responses were by providing a continuous moving picture of each market. This essay may, in a sense, then, be thought of as a clinical report of the evolution of business responses to a full cycle of experiential stimuli in a period when the markets, buffeted by the violent forces loosed at Versailles, revealed those responses more clearly than they do in less violent times.

It is perhaps appropriate at this point to mention briefly some of the problems with which we are not immediately concerned. The period under review is too short for the discovery or verification of typical relationships among such business phenomena as stock prices, production, wholesale prices, securities issued for new money, raw-material inventories, etc. We shall also forego the interesting possibility that the conjuncture of long-term cyclical forces—such as structural changes in the organization and implements of mass production, shifts in the relative position of various income groups, changes in the birth rate, relocation of population groups, or changes in basic habits of consumption—may actually be the phenomenon whose symptoms we study as the business cycle. Finally, it is not our purpose to offer any new theory of the business cycle or to alter or confirm any of the theories now existing.

We have described the purpose and the methods of this study. It will be helpful if we now acquaint the reader with some of the difficulties encountered in attempting to construct, out of the maze of currents and cross-currents, a coherent picture of the business experience of the period.

Because this was a period of violent changes, when markets were rarely the same for three months running, the greatest difficulty was simply to find out what the market situation was. The task was not made easier by the fact that, as cyclical turning-points were approached or passed, the behavior of the graphs of an industry could not be explained on reasonable grounds. So the problem frequently became: Why didn't the graphs behave differently? Furthermore, a careful reading of the market accounts revealed the curious fact that very little trade talk coincided with the movement of the graphs. There may be several partial explanations for this fact, though they do not entirely account for the discrepancy. Current data relative to new orders, backlogs, production, stocks, etc., were very seldom at hand; often they were closely guarded company secrets and, therefore, inaccessible to the reporters. With respect to prices, a rather interesting factor accounts for the lack of agreement. Generally the "tone" of the market changed considerably before price changes occurred. In unorganized markets the absence of accurate volume reports makes it impossible to discover what was going on by reference to price quotations alone. Market reporters, of course, were vitally concerned with this statistically unrecorded element. In addition to these two, there is a third technical reason for the lack of correspondence between the market reports and the behavior of the graphs. This is the fact that index numbers, of which most of the statistical series available are constituted, are averages, whereas market observations are usually concerned with particulars. Hence, in statistical series the beginnings of important developments are often buried under the immobility of the average.

Allowing for these technical obstacles, we still find an unsatisfactory gap between market talk and the behavior of the graphs, and the cause of this fault is more than superficial. Neither market observers nor businessmen know what the total situation is. We are prone to think of business responses in terms which are too simple to accommodate the facts. We are likely to assume that all branches of industry are working under one vast intelligence where logical responses are made to clear-cut stimuli.

One of the most impressive aspects of business behavior in the period under review is the raggedness with which the various segments of an industry reached their turning-points and the even more pronounced raggedness between the various industries themselves. The incredible complexity of forces at work in the economy at any given moment baffles the professional forecaster as readily as it does the market reporter and the businessman. It is all too easy to overlook that complexity in the past and to assume a singleness of purpose and behavior on the part of entrepreneurs that did not, in fact, exist. It is too easy to fix upon a hypothesis and to find it operating in simple unified pervasiveness, for the reason that the past has been lost to memory and a reasonable person may make of it what he wishes.

CHAPTER II

THE FINANCIAL SETTING

CREDIT, INTEREST RATES, AND FEDERAL RESERVE POLICY

THE financial experiences and especially the Federal Reserve policy of this period have received keen and voluminous critical examination by the many capable observers interested in this field. In order to provide necessary points of reference, however, it is desirable to review briefly the significant events of 1919 and 1920.

Before the war had ended, the consensus was that, when the government should cease filling the order-books of industry, prices would revert to earlier levels, which would bring in consequence unemployment, empty markets, and depression. Such fears were promptly justified, for January and February showed respective drops in industrial production of 3.6 and 5 per cent over preceding months. The general price level declined similarly. There seemed little doubt in the business mind that a depression was imminent. The forecasting services were uniform in their agreement during December, January, and February that a sharp reaction was under way. Typical of the unqualified predictions for early 1919 is that of Babson's on February 11: ". . . A period of trouble and depression is ahead. It cannot be sidetracked. We can prepare for reaction and prevent it from being disastrous, but to stop it is impossible."¹

Criticism has generally been directed to the failure of banking authorities to take action toward credit restriction during the spring of 1919. It is now apparent that, if government finances had been such that they could have co-operated with the banking group, deflationary action then would have done much to remove two years of violent price changes in both directions and the suffering attendant upon them. Criticism is unbalanced,

¹ "Barometer Letter," quoted in Hardy and Cox, *Forecasting Business Conditions* (New York, 1927), p. 347.

however, if it fails to take the prevailing mood and temper of the nation into account. When a real depression is under way, it is not the time in which public and private agencies undertake a vigorous public campaign to "deflate." Instead, during the first three months of the year, government, industry, and finance were doing all in their power to "come out of" what appeared certainly as the beginning of a long-expected, destructive storm. That the storm did not prove to be so drastic as anticipated is beside the point; the fear of it was both real and controlling. It blinded all alike to the fundamentally dangerous condition of the country's finances; and the lack of definite restrictive policies during March, April, and May can be traced properly to this fear. As a result, the consequences for the nation and for the world were disastrous.

By March or April it was apparent that the severity of the recession had been overestimated. As this realization became general, businessmen grew more inclined to build up stocks. As early as June there seemed little evidence that would not warrant optimism; and with this the inflated state of currency and credit began to produce its natural effects, working in the fertile soil of cumulated demands now released from war economy. A general view of the prevailing spirit is excellently recounted in the following passage:

Beginning in March, 1919, the situation changed, and we entered upon a period of tremendous inflation, increase in prices, unbridled speculation, and extravagance. This change in the situation was first apparent on the stock exchange. . . . The high wages of the war period continued. The personal restraints which considerations of patriotism had induced people to adopt for themselves were in large measure abandoned. The restraints which the government imposed upon individuals and upon industry, including those of the Food Administration, the Capital Issues Committee, and the various other measures designed to restrict personal expenditures and the use of credit were one by one removed. Thousands of persons who had bought Liberty Bonds sold these bonds or converted them by one method or another, and spent the proceeds on personal indulgences or made investments in high priced land, worthless oil stocks, etc. There was an orgy of spending. Merchants could not get goods from the manufacturer as fast as they could be sold.²

² U.S. Congress, House, *Report of the Joint Commission of Agricultural Inquiry*, Part II: *Credit* (House Rept. No. 408 [67th Cong., 1st sess.; Washington, 1922]), p. 42.

The tremendous increase in prices became the object of national concern by the latter part of July. In the newspapers everyone from political cartoonists to editors gave attention to the "H.C.O.L." It even crept into the comic strips. As a news story it occupied more space on front pages than any other subject, except possibly labor difficulties. President Wilson's triumphant return on July 8 from the Peace Conference and the historic struggle in Congress over the adoption of his proposals were soon displaced, as news, by the almost frantic governmental campaign to reverse the rising tide of prices. The recitation of a few front-page headlines³ which appeared during August will do much to recapture the public temper from which we later receded so far:

FIGHT TO CUT COST OF LIVING KEEPS HOUSE IN SESSION

THE ORGANIZED FIGHT TO REDUCE LIVING COSTS WILL THEN BE STAGED
IN EARNEST [after the "Committee of Three" makes its recommendations]

GOVERNMENT WILL REDUCE PRICE OF WHEAT ("... A drastic campaign
against hoarding and speculation, with the possibility of new legislation
by Congress predicted.")

CABINET COMMITTEE AIMS AT PROFITEERS

PRESIDENT SPURS FIGHT TO CUT THE H.C.O.L.

REED URGES JAILING OFFENDERS [i.e., profiteers]

WILSON TO ADDRESS CONGRESS SOON ON C.O.L.

TO BEGIN WAR ON HOARDERS

[Attorney-General] PALMER ANNOUNCES VIGOROUS EFFORTS AGAINST
PROFITEERS

PROSECUTION OF PACKERS ORDERED IN LIVING COST FIGHT

PLANS TO SMASH PROFITEERS AND HOARDERS MUST GO TO CONGRESS—
WILSON

MESSAGE ASKS LAW TO PUNISH PROFITEERS [the President on August 8
gave his message on prices to a joint session of Congress]

29 WAREHOUSES MUST REPORT FOOD IN STORAGE [in New York]

CONGRESS TO RUSH ANTI-PROFITEER LAWS

200 CARS OF ARMY SUPPLY FOOD ALLOTTED TO NEW YORK FOR SALE

PALMER MOVES TO CHECK RETAILERS BY WIDE "FAIR PRICES" CAMPAIGN

PALMER CALLS FOR 1.5 MILLIONS FOR FIGHT ON PROFITEERS; WANTS LAW
TO COVER CLOTHING; HIS AGENTS SEIZE FOOD; 19 BIG CEMENT COM-
PANIES ORDERED PROSECUTED

³ Taken from the *New York Times* for the month of August, 1919.

400 CARS OF [Army] FOOD FOR CITY; MEATS GO HIGHER

GOVERNMENT BEGINS FOOD SEIZURE; FAIR SUGAR PRICE SET AT 11¢

A VERITABLE ORGY OF EXTRAVAGANT BUYING IS GOING ON [reported by W. M. Lewis, director, Savings Division, Treasury Department, upon his return from a circle visit to the Federal Reserve banks; he said further that retailers want only delivery; prices seem no object.]

COTTON HAS DROPPED 75-82 POINTS; HI-COST INQUIRY NOTICED

GOVERNMENT BACKS BIG OHIO FIGHT ON FOOD HOARDERS [Under the Lever Act, agents seized 200,000 pounds of sugar. It was to be adjudged hoarded and ordered condemned, then to be sold by the government.]

TO HOLD PRICE CONFERENCE HERE; FOOD RAIDERS ARE BUSY; CONTINUE SEIZURES

WILSON CALLS A HALT ON RAILWAY WAGE INCREASES; TELLS SHOPMEN TO WAIT; SEES A DROP IN PRICES COMING

The last line above strikes a rather tragic note, for the prices with which the protesting wage-earners were vitally concerned continued to rise for another year. The President's proposals, which his message conveyed to Congress, and that body's action to combat high prices are remarkable for their lack of any reference to the real seat of trouble. Instead of looking to the Treasury's borrowing program, laws were passed against profiteering. The Lever Food Control Act of 1917 was strengthened, and under it stores of "necessities" were seized and sold. The Federal Trade commission was set upon several industries where exorbitant profits were suspected. Fair-price committees, established in many of the consumer industries, published price lists to guide buyers and prevent their being charged in excess of "reasonable" prices. Retailers suffered severe penalties for receiving more than the legal price on sugar. Army food stores were placed on the markets at reduced prices. In addition to laws against profiteering, Congress considered laws to limit the time food might remain in storehouses, to license food companies whose products entered interstate distribution, and to mark the price received by the producer on each unit leaving his hands. That Congress was ignorant of or unwilling to acknowledge the identity of its foe is clear. A storm of protest arose both in and out of Congress when, in the spring of 1920, the Federal Reserve took over the government's

losing fight and directed an offensive along lines designed to reach the real trouble.

In the Federal Reserve System the country possessed a new and relatively untried instrument of banking control, serving effectively as a central bank. In this unusual episode of expansion and eventual destruction of credit, with its concurrent violent swings in prices, the activities of a central bank and the policies which determine them, along with their assignable consequences, war-rant most careful attention.

Any evaluation of the Federal Reserve's objectives and effectiveness must begin with an understanding of the government's relation to the Board during its vast war-financing program. The Federal Reserve acted as fiscal agent for the Treasury Department and, for all practical purposes, was controlled completely by the government. That the Board was not free to take independent action concerning rates is common knowledge, attested often, with a note of restiveness, throughout 1919 in the *Federal Reserve Bulletin*. Not only was the Board denied its prerogative respecting rates, but the very mechanism by which the Reserve banks were required to participate in the distribution of war obligations to subscribers prevented any possibility of effective control of credit. War financing did not end with the armistice. Hence, it was futile, as pointed out later by R. C. Leffingwell,⁴ then assistant secretary of the Treasury, to talk of credit control while the huge floating debt of about 8 billions (August, 1919) was present and which it was the purpose of the Victory Loan to take up. This Loan was not entirely paid for until the last part of November, 1919; and, since the practice of the Federal Reserve banks was to carry purchasers' notes and bills secured by government paper at or below the bond rates, it was probably sometime thereafter before the Reserve banks' portfolios were cleared of paper arising from such transactions. In fact, the Board was not freed entirely of Treasury control until the last issues of Treasury cer-

⁴ "The Discount Policy of the Federal Reserve Banks," *American Economic Review*, March, 1921, p. 32 (hereafter cited as *AER*).

tificates bearing the $4\frac{3}{4}$ rate had been distributed some time in January, 1920.⁵

One more factor in the handicap placed upon the Board's power to influence the expansion of credit was the bond-purchase fund, the results of which are best described by Leffingwell:

The Treasury was in honor bound to use the bond purchase fund established by Congress for that purpose to support the market for Liberty Bonds. Thus, whatever pressure upon the money market resulted from the efforts of the Federal Reserve authorities to control credit was automatically relieved by the Treasury. It is noteworthy that efforts to control credit never gave any sign of becoming effective until in April, 1920, the Treasury's moral obligation having been satisfied, it discontinued purchases for the bond purchase fund.⁶

With this brief reminder of the subordination of the banking system to the Treasury, we may look now to the specific actions which the Reserve Board was, nevertheless, independently able to take. We shall first compare briefly the movement of the rediscount rate on 61-90-day commercial paper with the other principal market rates for money. Following this, we shall examine closely the Board's handling of its 1-15-day rate and the effects which changes in this rate produced in the security markets.

In matters concerning the market for funds it is customary to look to New York. For that reason special significance attaches to the actions of the Federal Reserve Bank of New York as reflecting the actions and opinions of the Board. It is that bank's rate, then, to which attention will first be given. Although the discount rate on commercial paper seems, in this special episode, to be of secondary importance (for reasons which will be offered later), it is necessary to review its use by the Federal Reserve, if only because of the attention it has conventionally received.

The discount rates on 61-90-day commercial paper approved by the Board and established by the New York Federal Reserve Bank are as follows:

⁵ See O. M. W. Sprague, "The Discount Policy of the Federal Reserve Banks," *AER*, March, 1921, p. 23.

⁶ *Op. cit.*, p. 33.

4 $\frac{3}{4}$.....1918 April 6	5 $\frac{1}{2}$.....1921 July 21
6.....1920 Jan. 26	5.....1921 Sept. 22
7.....1920 June 1	4 $\frac{1}{2}$.....1921 Nov. 3
6 $\frac{1}{2}$.....1921 May 5	4.....1922 June 22
6.....1921 June 16	

This rate, compared with ten of the principal market rates⁷ for short- and long-term funds, reached its maximum in advance of the others by about 3 months. The latter figure, the median, is not very characteristic, since it lacks pronounced central tendency. As might be expected, call money and municipal-bond yields formed opposite limits. The rest were grouped within a 1-8-month period indicating the earlier maximum of the official rate over all the others except call money. On the downturn, however, the official rate lagged by an average of about 4 months, although this figure, again the median, is by no means a satisfactory generalization, owing to an even greater range and lack of central tendency, with call money, south and west customer-bank rates, and public utility bond yields beyond the range of the standard deviation.

With all these exceptions, it is, nevertheless, safe to declare that the New York Federal Reserve rate reached its maximum ahead of market rates and was lowered only after the more sensitive of the market rates had receded from their peaks. This in itself would not be important without reference to the height of the official rate compared with the market cost of funds. The New York discount rate generally surpassed the market rates, on June 1, 1920, with its jump from 6 to 7 per cent. Important exceptions are that it remained below the commercial-paper rate throughout but above the municipal-bond yield and, omitting January, May, and June, 1920, the bankers' acceptance rate as well. Descending call-money rates became about equal to the Reserve rate in December, 1920, and, with 90-day time rates beginning in January, followed the Reserve rates closely thereafter.

⁷ These were: (1) call-money rate, New York; (2) 90-day rates on mixed collateral, New York; (3) bankers' acceptance; (4) commercial paper; (5) New York bank (customer) rates; (6) same for eight northern and eastern cities; (7) same for twenty-seven southern and western cities; (8) yields of fifteen high-grade industrial bonds; (9) same, public utility bonds; and (10) same, municipal bonds (see Chart I at end of this section).

In summarizing the behavior of the New York Reserve rate, it is fairly accurate to say that it went higher, reached its maximum earlier, and remained there longer than the principal market rates. On the other hand, the average discount rate on 61-90-day commercial paper for the system as a whole lagged behind the market rates by about 6 months at the top and about 4 in turning down. The average for the System was lower throughout than the New York rate; and it is interesting to observe that it was also lower than the customer rates in both the north and east banks, the south and west banks, and the public utility bond yields. The general behavior of the average rate for the System did not differ greatly from the New York rate, but it was below the sensitive market rates well into 1921, although the median date at which it overtook the principal rates, excepting the four just noted, fell about February, 1921. Another distinguishing characteristic was the tendency of the average rate to approximate and move with the sensitive rates after their level was reached. Hence, in summarizing the behavior of the average rate for the System, it should be said that it reached its peak after the market rates, did not typically surpass those rates which it overtook, and declined rather evenly with them.

It is an error in emphasis to confine attention to the discount rate set by the Reserve banks for commercial paper, especially by the New York bank. A larger source of error arises from a failure to isolate for special consideration the rates on 1-15-day maturities. Tables 1 and 2 will indicate the underlying reasons. For New York it is apparent that a rate change in the 1-15-day maturities would affect practically all discounts and that a change in the rate on notes secured by war paper would reach about three-fourths of all discounts, including all member-banks' notes. For the System the proportions of paper which would be affected by rate changes in these two classifications are fractionally smaller. By way of comparison, the 15-day paper discounted by the New York Federal Reserve Bank is about half the total discounts of the entire System. Hence, in this period it is uniquely essential, in seeking an index to Reserve bank policy, to give careful attention to events which touch these two categories. Rate changes in New York involving both are given in Table 3, in order that the

rather complicated relationships between class rates may be kept more easily in mind. On November 4, 1919, after clearly foreshadowing such action in the October *Bulletin*, the New York

TABLE 1*
AMOUNTS OF BILLS DISCOUNTED BY THE NEW YORK FEDERAL RESERVE
BANK AND BY ALL FEDERAL RESERVE BANKS
DISTRIBUTED BY MATURITIES
(In Millions)

FOR THREE MONTHS ENDING		MATURITIES		15-DAY (PER CENT OF TOTAL)
		15-Day	Total	
December, 1919.....	New York	\$12,552	\$12,820	98
	System	21,366	22,765	94
March, 1920.....	New York	10,491	11,008	95
	System	17,671	19,729	89
June, 1920.....	New York	9,401	9,772	96
	System	16,478	18,702	88

* From data given in the *Federal Reserve Bulletin*, 1920, pp. 191, 530, 870.

TABLE 2*
DISCOUNTED BILLS, INCLUDING MEMBER-BANKS' COLLATERAL
NOTES, HELD BY THE NEW YORK FEDERAL RESERVE BANK
(In Millions)

	End of December 1919	End of May 1920
Member-banks' collateral notes secured by government war obligations†.....	446	425
Customers' paper secured by government war obligations.....	138	144
Total bills secured by war paper.....	584	569
Total bills held (less acceptances).....	765	781
Bills secured by war paper as percentage		
Of total bills (less acceptances).....	76%	73%
Of total discounts.....	74%	71%

* From data given in the *Federal Reserve Bulletin*, 1920, pp. 193, 741.

† It is interesting to observe that no other collateral than government paper was offered by banks.

Reserve Bank lifted the rates on both 15-day and governments, affecting about 98 per cent of its discounts.⁸ Notes secured by

⁸ This increase was given added significance by the appearance a few days later of the November *Bulletin*, which condemned the use that member-banks were making of credit facilities of the Reserve banks and promised still further rate increases (cf. pp. 1010-11).

other collateral than war paper suffered a rate increase of $\frac{3}{4}$ per cent, while governments were increased only from 4 to 4.5 per cent. This served only to abolish the differentials in favor of short maturities. It still left a differential in favor of governments. Notwithstanding the caution of these "fractional increases in rates," observed Leffingwell, "a quasi-panic in the securities market, particularly in government bonds, developed."⁹ In the "Spe-

TABLE 3*
SELECTED NEW YORK FEDERAL RESERVE DISCOUNT RATES

DISCOUNTED BILLS (INCLUDING MEMBER-BANKS' 15-DAY COLLATERAL NOTES) SECURED BY LIBERTY BONDS AND VICTORY NOTES		OTHERWISE SECURED AND UNSECURED (INCLUDING MEMBER-BANKS' 15-DAY COLLATERAL NOTES)		
Within 15 Days	16-90 Days	15 Days	16-90 Days	Approved by Board
4	4 $\frac{1}{4}$	4	4	(Obtaining 6/ 1/19)
4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	11/ 4/19
4 $\frac{3}{4}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	12/11/19
5 $\frac{1}{2}$	5 $\frac{1}{2}$	6	6	1/21/20
6	6	7	7	6/ 1/20

* From data given in the *Federal Reserve Bulletin*, 1919, pp. 698, 1106; 1920, pp. 2, 118, 558.

cial Reports" section of the *Bulletin* for the Second District, the consequences are described as follows:

Following the increase of discount rates at the Federal Reserve Bank, call money stiffened at once to 10, 12, 14 and 16 per cent, and on November 12 [when call money reached 30 per cent (see *Federal Reserve Bulletin*, 1920, p. 127)], after a week of hesitation, prices broke violently. . . . Industrial stocks as a group closed 12 $\frac{1}{2}$ points . . . below the highest of the year. Certain industrials which had been the leaders on the rising market closed from 51 to 126 points below the year's high record.¹⁰

In explaining its authorization of the rate increase, the Board declared bluntly that "the use by member banks of the resources of the system for speculative advances to their customers required the application of a corrective to the situation."¹¹ It fur-

⁹ *Op. cit.*, p. 33.

¹⁰ *Federal Reserve Bulletin*, 1919, p. 1121 (hereafter cited as *FRB*).

¹¹ *Ibid.*, p. 1107; note the force of past tense.

ther pointed out in the same tenor that it was not the intent of the Federal Reserve Act that government bonds (although admittedly now plentiful) were to be used "for making good reserves which may previously have been depleted by making ineligible loans."

The Board's and the New York Reserve Bank's action was undertaken for the purpose both of curbing speculation and of protecting the reserve ratio, which was moving continually lower as a result, in part at least, of member-bank accommodation for security speculation. The Board had always been unalterably opposed to an expansion of credit drawn for uses of this nature. But this time there was an additional element in its apprehension: the reserves were approaching the legal limit, with some banks already below it. "It could not be expected, however, that the changes in rates would bring about immediately a strengthening of the reserve position of the system as a whole,"¹² said the Board in measuring the results of its first effort to combat post-war inflation.

So, in a renewed attempt to enforce bank compliance with what it conceived as both the legal and the economically correct use of discounts, the Board on December 11 approved another rate increase, this time on governments alone, affecting about three-fourths of the paper held by the New York Federal Reserve (including, pointedly, all member-banks' notes). The increase was a small one (from $4\frac{1}{2}$ to $4\frac{3}{4}$), but it abolished all remaining differentials in favor of war paper as collateral. The results of this second upping of rates paralleled those of the preceding month:

The announcement of the fractional increases in rates by this bank on December 11 was followed by a day of high call money rates and active liquidation. . . . The liquidation which developed in stocks was far more pronounced in the bond market. . . . Although three-quarters of the transactions were in United States bonds, the prices of which fell, the declines in the prices of corporation bonds were heavier.¹³

On January 6 Governor Harding, addressing the bankers called to Washington to discuss the undesirable state of bank credit and their responsibility in its correction, warned that further rate increases were necessary. On the twenty-third of the month they

¹² *Ibid.*, p. 1106.

¹³ *Ibid.*, 1920, p. 19.

were advanced, commercial paper of all maturities to 6 per cent but governments only to 5.5 per cent. The market response to this was not discernible in the midst of prevailing high call and renewal rates and falling bond and stock prices.

That of January 23 was the last change in rates to be made before June 1, when commercial paper was boosted to 7 per cent and governments to 6 per cent. It is past doubt that the rate applicable to 15-day discounts secured by government collateral was the leading and controlling rate of the bank. And some rather important characteristics may be noted about its general behavior. If June, 1919, is set as the base, it rose faster than any of the market rates except call money. It reached its maximum level (6 per cent on June 1) earlier than they. But it was below all market rates at all times, with minor short-lived exceptions, if yields on municipal bonds after November 4, 1919, be excluded. It was also below the 60-90-day commercial-paper rate throughout.

What, then, is to be concluded about its influence, inasmuch as it was the leading bank rate in the country between June, 1919, and June, 1920? Or, more properly, what consequences, in terms of objectives, may be associated with the Reserve Board's actions? While it is apparent that the Board was attempting to curb speculation wherever it existed, it is also apparent that whatever action was undertaken would affect the security markets as well as other markets. And, since the Board acted with this knowledge in mind, it is reasonable to measure the results of its efforts in terms of security-market behavior. In passing, it might be remarked that the behavior of the security market is so well reported, compared with other markets in which speculation may be equally advanced, that we are likely to overlook events in the latter merely because of poor records.

In February, 1919, the stock market¹⁴ began a vigorous rise which extended into the third week in July. After a quiescent August and September, it resumed its upward thrust during Oc-

¹⁴ Standard Statistics Stock Price Index, 337 Industrial Stocks. The group stock price indices referred to subsequently are also those of Standard Statistics. Weekly indices are based on Wednesday's closing prices.

tober and culminated in the events of November 12 just described. The reaction was overdone, apparently, for the market strengthened during the remaining 2 weeks in November, making gains which it held until the year's end. Between January 28 and February 11, however, the market lost more ground than it had in the bad week of November 12. Nevertheless, at the end of February a strong recovery set in to carry prices upward throughout March, to establish, in the first and second weeks of April, a high level, only 9 per cent short of the November peak. In the third week of April the market again gave way, this time with no recovery to near-peaks.

The response of the general market to the November 4 action of the Reserve Board leaves small doubt as to immediate causes. The week of November 12 saw the termination of the bull movement. It is probably unnecessary to point out that it was not the burden of the increased rates per se which brought about the active liquidation but rather that the banking authorities were bringing overt and heavy pressure against the speculative use of borrowed funds. The rate increase authorized on December 11 affected bond prices considerably, but stock prices did not show much response. The new rate, effective January 23, may have been the factor which precipitated the 2 weeks' decline ending February 11, but the evidence on this score is not conclusive.

In appraising the relationship of the Federal Board to the securities market, it is a mistake to rest one's conclusions on the behavior of an over-all index of stock prices, on the one hand, or a small index of market leaders, on the other. Broken down into industry groups, the behavior of stock prices presents a strikingly different picture from that of the total market, as far as turning-points are concerned. Bull markets were terminated, for example, for rails and chemicals, in May, 1919; for utilities, United States Steel, agricultural implements, tires, nonferrous metals, and mining and smelting stocks at the end of June and the middle of July; for iron and steel, shipping and shipbuilding, electrical equipment, and retail trade at the end of October. Autos and auto parts and railroad-equipment stocks were the only important groups to end their upswing in the November setback, and among

these the autos and parts were certainly speculative. Textiles continued their rise to the end of December. Climaxing the March revival, which was shared by the whole general list, new highs were established by the sugar, mail-order, amusement, and food-product groups in the second week of April, 1920.

Thus, while it is accurate to say that the cap of speculative quality was removed from the market as a result of the Board's action in November, it is not reasonable to conclude that the market was therein deprived of its power to make appraisals of stock values independently. Moreover, money stringency did not appear just for the first time with the advent of the new November rate. Call loans from June to November set monthly highs of 15, 18, 6, 15, 19, and 30 per cent, respectively. Whether these rates developed independently of the Federal Reserve Board's attitude or whether they were a reflection of that attitude during these months is not clear. The attitude of the Board and of the New York bank toward the speculative use of funds obtained through the discount of government collateral was well publicized. In May, 1919, the Board noted and discountenanced the growing speculative activity on the New York Stock Exchange and regretted its inability to take independent corrective action.¹⁵ Beginning in June, member-banks were asked what became of their funds. Beginning in September, "direct action" was undertaken to curtail credit for "nonessential" demands. In October frank forecasts of higher rates were made in the *Bulletin*¹⁶ and questions raised as to their probable efficacy. By November the Victory notes were paid for, and the Board felt relieved of a major portion of its moral obligation to the Treasury. By November, also, conditions of which it disapproved in June, July, and August had only grown more opprobrious.

Thus the general market, in discounting the prospects for the various industry groups of stock between May, 1919, and April, 1920, may have been influenced more than we are prepared to concede by the series of announcements, statements, inquiries, and promises of action on the part of the Board. A definitive conclu-

¹⁵ *FRB*, May, 1919, pp. 523-24.

¹⁶ *Ibid.*, October, 1919, pp. 910-12.

sion on this point cannot be set forth with confidence. Nevertheless, one is bound to feel that the market was making its own decisions from May through October, 1919, at least, and that it was becoming increasingly pessimistic over an expanding number of industries during this period. How soon this growing pessimism would have superseded the remaining bullish sentiment, had the market been left entirely to itself, cannot be known. It is likely, however, that the Board's action in November merely helped the market reach a decision which it was in the process of reaching of its own volition.

So far we have judged the effectiveness of the Board's struggle against speculation only by reference to the security markets. An evaluation of the Board's effort with reference to commodity markets is more difficult to make. But, from the results of the industry studies which are to follow, it appears that the dampening of speculative activity in commodities was more intimately connected with matters relating to the individual industries than with Federal Reserve actions.

Our study of Federal Reserve policy up to this point has been concerned with the events taking place, for the most part, while the System was under Treasury domination. The return of the Reserve Board to independence began in November, 1919, and was apparently completed in January, 1920. Between April, 1919, and the latter date the Board was mainly concerned with the speculative use of credit. This problem appeared also to be its major concern during the first 2 months of freedom—February and March, 1920. But a change in attitude and policy did, however, come over the Board, beginning, as far as records will permit a guess, in April and May. We shall now take up this new development.

On April 7-10, 1920, the Board held its regular meeting with the governors of the Federal Reserve banks, at which time the problem of credit control "was conceived as being not simply that of restricting the general volume of credit but more particularly the speculative use of it."¹⁷ While the emphasis is still on the use made of credit, a new element frankly appears—the desire to

¹⁷ *Ibid.*, May, 1920, p. 456.

diminish the actual volume in force. By the end of the month a statement was issued by the New York Federal Reserve Bank which "called attention to the continuous growth of credit and urged upon member banks the necessity . . . of shortening outstanding lines."¹⁸

The next outstanding event in the development of a new attitude is reported by the *Bulletin* as follows:

On May 17-18 the Federal Reserve Board in a session with the Federal Advisory Council and with Class A Directors of Federal Reserve Banks gave careful consideration to the credit situation. . . . The Advisory Council recommended the plan of "urging upon member banks . . . the wisdom of showing borrowers the necessity of the curtailments of general credit, and especially for non-essential uses, as well as continuing to discourage loans for capital and speculative purposes; by checking excessive borrowings through the application of higher rates."¹⁹

Next, the Senate, in a resolution dated May 17, asked to be informed as to what measures the Board proposed to employ "to meet the existing inflation of currency and credits and consequent high prices" and how it expected to mobilize credits to move the 1920 crop. The Board in its answer on May 25, 1920, declared, among other things, that it had "repeatedly admonished the Federal Reserve Banks that influence should be exerted upon member banks to induce them to avoid undue expansion of loans and to keep their volume of outstanding credits within moderate bounds."²⁰

Acting on the recommendation of the May 18 meeting, the Board on May 29 authorized another increase in discount rates, already described. This meeting brought forth a storm of protest. (When its minutes were obtained and published 3 years later by the *Manufacturers' Record*²¹ and Congress,²² it became

¹⁸ *Ibid.*, June, 1920, p. 556.

¹⁹ *Ibid.*

²⁰ *Ibid.*, p. 558. On pp. 582-84 Governor Harding's reply reports in full the substance of the May 17-18 meeting which was called by the Federal Advisory Council.

²¹ *Manufacturers' Record*, February 22, 1923. Reprinted, along with the bitterly critical emendations of Editor Richard H. Edmonds, in *Congressional Record* (67th Cong., 4th sess.; February 28, 1923), pp. 4858-66; see also Senator Heflin's remarks (pp. 4869-75).

²² U.S. Congress, Senate, *Federal Reserve Board Conference, February 24, 1923* (Senate Doc. No. 310 [67th Cong., 4th sess.; Washington, 1923]), p. 62.

the object of vicious and unrelenting attack from many sections of the industrial and political community.) That its agenda were obnoxious to inflationary groups in Congress is plain, for discussion was both intelligent and frank on the necessity and means of halting credit expansion. The minutes are particularly illuminating for the light they throw upon the abnormal credit demands thrust upon the banks by car shortage, terminal strikes, and general traffic paralysis. Because of the crucial influence of these factors upon credit conditions in April and May, 1920, it will be useful to give at some length the Board's attitude toward the difficulties facing it:

The development of certain abnormal demands and their influence upon the credit situation have been observed within the past month. . . . Considerable amounts of goods have been withheld from the market in the hope of higher prices and have been financed with bank credit . . . the continuous carrying of goods which have thus been hoarded preventing the considerable amount of liquidation which would ordinarily take place.

On the other hand, large amounts of the limited railroad transportation of the past month have operated to bring about a condition of increased strain upon bank credit. As a result of this situation, full and effective operation of the railroads has become necessary in order to enable remedial banking measures to produce their best result. . . . Great sums are tied up in products which, if marketed, would relieve the strain on our credit system. This congestion of freight is found in practically all of the large railroad centers and shipping ports. It arises chiefly from inadequate transportation facilities available at this time and is seriously crippling business.

. . . The bank reserves would probably be sufficient if quick transportation could be assured. . . . So extensively has the artificial congestion of goods, due to inadequate transportation facilities, interfered with the normal process of marketing that it has of late been difficult to differentiate between demand for credit growing out of impeded marketing and demand originating in the effort to accumulate stocks and raise prices.

. . . The reduction of output has not helped the transportation situation but is rather the product of the latter, there being an accumulation of goods at many points on account of inability to obtain cars to move them.²³

It is clear that the Board had definitely come to believe that bank credit in its net amount should be decreased. Its decision to undertake measures looking to that end cannot be dated with certainty. Although representing but a small portion of total

²³ *FRB*, June, 1920, pp. 555-61.

earning assets and having, therefore, commensurate influence, holdings of government securities offer a fair index to Reserve policy; these declined in April. By May, as the quotations given above amply show, the Board was clearly committed to a single purpose. It saw the reserve ratio steadily slipping, gold (up to May) flowing out of the country, prices increasing at a startling rate, and goods not moving. In addition to the excessively high level of credit demanded for early and self-liquidating uses, there was this abnormal, superimposed demand for credit covering goods not moving due either to speculative withholding or to traffic paralysis. Recourse to Reserve credit was increasing faster than member-bank loans and discounts. Production reports had revealed successive declines for many weeks, business failures were sharply up, and most businessmen were either experiencing or anticipating drastic recessions. The Board, during the last half of May, could not have helped realizing that danger was imminent. It could choose to tighten credit and save banks from further overextending themselves, thus avoiding for some and softening for others the added suffering which eventual readjustment would bring; or it could relax credit restrictions, hoping that the readjustment would not strike all simultaneously and thus enabling liquidation to take its course gradually over an extended period. It chose the policy of restricting credit; yet its volume of accommodations increased.

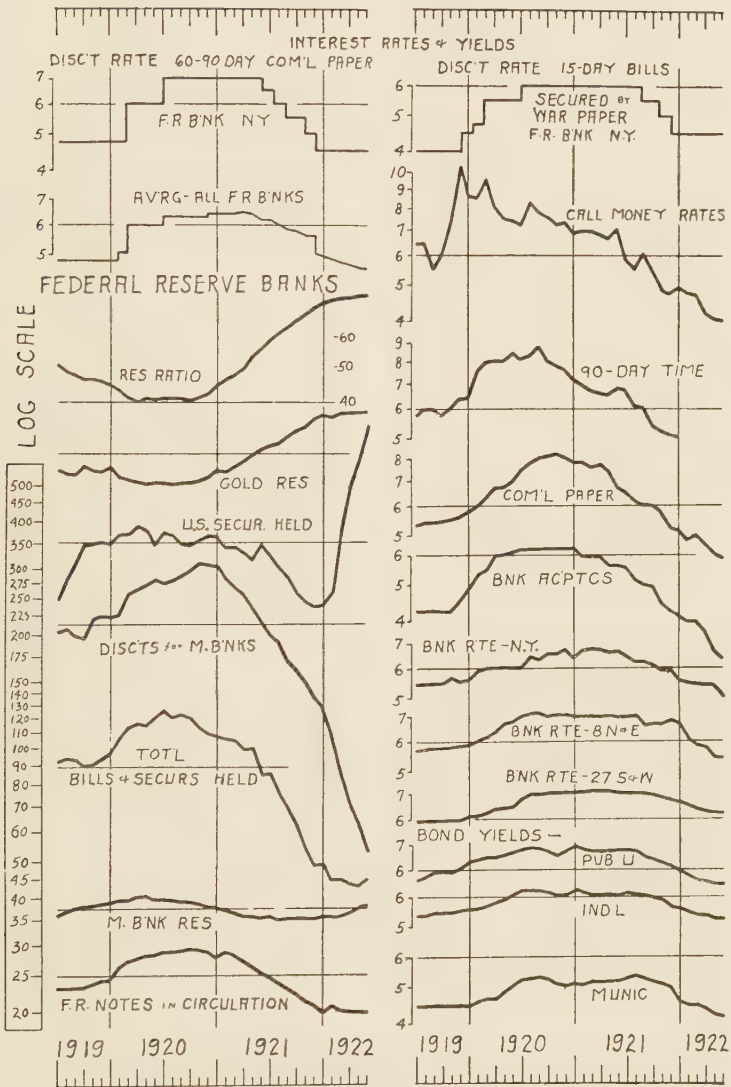
Maximum rates at New York were in effect from June 1, 1920, to May 5 of the following year. The Board's failure to lower them in accord with falling prices, with a view to alleviating the destructive force of liquidation, has been the subject of much criticism. The unfortunate aspect of the Board's excuse (that high rates were necessary to force speculatively held stocks of goods to move through trade channels) is that the Board unnecessarily placed itself in the position of having to make an excuse. It is entirely probable that if rates had been reduced to 4 per cent on May 25, 1920, the course of events would have remained unchanged. A gradual decline in prices from inflationary peaks is not typical. Some hold that it is impossible.

BANKING AND FINANCE

- Discount rate, 60-90-day commercial paper, Federal Reserve Bank of New York.
- Discount rates, 60-90-day commercial paper, average of all Federal Reserve banks.
- Reserve ratio, Federal Reserve banks; monthly average of daily figures. Adjusted for seasonal. Federal Reserve Board.
- Total gold reserves, Federal Reserve banks, end of month. Adjusted for seasonal. Federal Reserve Board.
- U.S. securities held, Federal Reserve banks; monthly average of daily figures. Adjusted for seasonal. Federal Reserve Board.
- Bills discounted for member-banks, Federal Reserve banks; monthly average of daily figures. Not adjusted for seasonal. Federal Reserve Board.
- Total bills and securities held by Federal Reserve banks; monthly average of daily figures. Adjusted for seasonal. Federal Reserve Board.
- Member-banks reserve, Federal Reserve banks. Adjusted for seasonal. Federal Reserve Board.
- Federal Reserve notes in circulation. Adjusted for seasonal. Federal Reserve Board.
- Discount rate, 15-day bills secured by government war obligations, Federal Reserve Bank of New York.
- Call-money rates, mixed collateral. Weekly average of renewal rates, 1919; thereafter daily renewal rates. Adjusted for seasonal. New York Stock Exchange. F. R. Macaulay, National Bureau of Economic Research.
- 90-day time-money rates, New York City. Adjusted for seasonal. F. R. Macaulay, N.B.E.R.
- Commercial paper rates, New York City. Adjusted for seasonal. F. R. Macaulay, N.B.E.R.
- Prime bankers' acceptances, 90-day, monthly averages of daily quotations. Not adjusted for seasonal. Federal Reserve Board.
- Rates charged customers by banks, New York City. Not adjusted for seasonal. Federal Reserve Board.
- Rates charged customers by banks, eight northern and eastern cities. Not adjusted for seasonal. Federal Reserve Board.
- Rates charged customers by banks, twenty-seven southern and western cities. Not adjusted for seasonal. Federal Reserve Board.
- Yields of fifteen high-grade public utility bonds. Not adjusted for seasonal. Standard Statistics Co.
- Yields of fifteen high-grade industrial bonds. Not adjusted for seasonal. Standard Statistics Co.
- Yields of fifteen high-grade municipal bonds. Not adjusted for seasonal. Standard Statistics Co.

CHART I

BANKING AND FINANCE

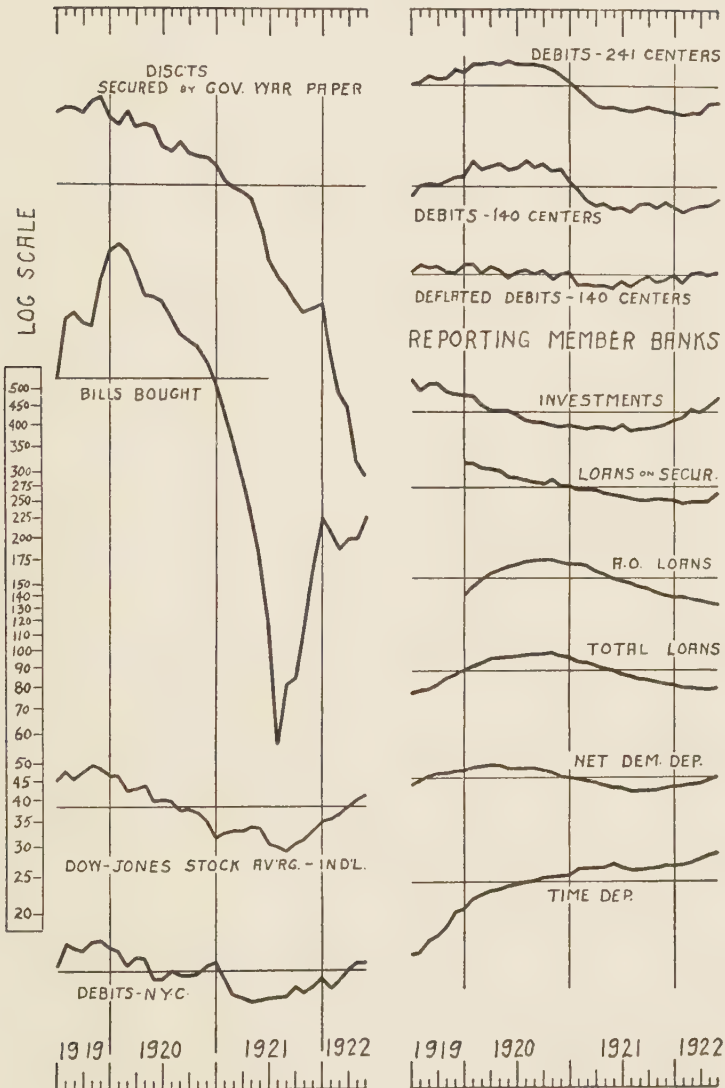


BANKING AND FINANCE—Continued

- Holdings of discounted bills secured by government war obligations, Federal Reserve banks. Last Friday of month. Not adjusted for seasonal.
- Bills bought, Federal Reserve banks. Monthly average of daily figures. Adjusted for seasonal.
- Dow-Jones stock price averages; twenty industrial stocks. Not adjusted for seasonal. Monthly figures computed by the National Bureau of Economic Research by averaging the monthly high and low.
- Bank debits, New York City. Adjusted for seasonal. Federal Reserve Board.
- Bank debits, 241 selected centers, excluding New York City. Adjusted for seasonal. E. Fricky, *Review of Economic Statistics* (May, 1931), p. 77.
- Bank debits, 140 centers, excluding New York City. Adjusted for seasonal. Federal Reserve Board.
- Deflated bank debits, 140 centers excluding New York City. Deflated by dividing debits by Carl Snyder's Index of the General Price Level. Adjusted for seasonal. F. R. Macaulay, N.B.E.R.
- Investments, reporting member-banks. Monthly average of weekly figures, 101 cities. Not adjusted for seasonal.
- Loans on securities, reporting member-banks. Monthly average of weekly figures, 101 cities. Figures for January through November, 1919, not available. Adjusted for seasonal.
- All other loans, reporting member-banks. Monthly average of weekly figures, 101 cities. Figures for January through November, 1919, not available. Adjusted for seasonal.
- Total loans, reporting member-banks. Monthly average of weekly figures, 101 cities. Adjusted for seasonal.
- Net demand deposits, reporting member-banks. Monthly average of weekly figures, 101 cities. Adjusted for seasonal.
- Time deposits, reporting member-banks. Monthly average of weekly figures, 101 cities. Not adjusted for seasonal.

CHART II

BANKING AND FINANCE (CONT'D)



FOREIGN TRADE AND THE NET UNFUNDED BALANCE

While an extended survey of international trade balances is far beyond the scope of the present study, it is nevertheless necessary to give them at least summary attention because of their obvious influence upon our credit problems during 1919 and 1920.

The United States, whose vast war machine had built up large stocks of staples, was anxious to dispose of them abroad to avoid breaking the market at home. European consumption, long postponed by exigencies of war, was potentially high, and the great outward flow of goods commenced. Between the armistice and December 31, our exports probably totaled 914 millions. The year 1919 showed 7,920 millions. Beginning with January 1 of that year, exports increased each month by almost 12.5 per cent, to set an all-time peak in June. In this same interval our net balance of trade rose with almost equal speed. In 1920 an all-time high of 8,228 millions for any calendar year was established, but 1921 saw a drop to 4,485 millions. These sums, however, name only the dollar volume and, although they set the problem of credit, fail to indicate the real flow of commodities.

We gain a new and valuable perspective by considering the Federal Reserve Board's Foreign Trade Index,²⁴ which is designed to eliminate price variations and thus shows changes in the physical volume of exports. Both the Board's index and the dollar volume of exports rose with about equal rapidity from January to June, 1919, and both declined thereafter, the index fairly slowly, its trend²⁵ reaching a low in August, 1920, rising thereafter by about 10 per cent to August, 1921, and falling away gently. But the dollar-volume trend behaved quite differently, falling only about 8 per cent from its June high, recovering in December to reach another near-peak in March or April, 1920, and then to drop (sharply after October) by almost 62 per cent to a depression low in 1921. In short, the two series moved together until November,

²⁴ *FRB*, December, 1920, p. 1257. The export index comprises twenty-nine commodities which, in 1913, accounted for about 56 per cent of the total dollar volume. It is noteworthy that most of the commodities receiving substantial attention in the present study are included in the index.

²⁵ Freehand smoothing of series. The same is true of dollar volume.

1919, and in opposite directions thereafter. It is of interest to note in passing that the Board's export index shows consumers' goods leading producers' goods and raw materials until July, 1920, whereupon producers' goods took the lead, which they held until May, 1921.

Imports, in so far as they reflect mainly the condition of business at home, do not much concern us here, except for the trade balance which they help to condition. Because of the unusual proportions that it assumed, that balance gave rise to grave and pressing problems, in the solution of which not only those immediately concerned—the government, exporters, and banks—but the citizens as well were obliged to participate. The trade balance in favor of the United States in the interval between the armistice and the end of the year was perhaps 519 millions. For the year 1919 it was 4,016 millions; for 1920, 2,949 millions. Of course, these are trade balances with the world and include unfavorable balances with South America and the Orient, thus understating the real magnitude of the problem of financing Europe's net imports from us, which in 1919 were 4,437 millions and, in 1920, 3,239 millions.

In the manner in which these obligations were met, whether by payment or by evidences of debt, the economic problem was framed. Those exports for which payment was made immediately posed no problem with which we are concerned. But both the amount and the form of debt arising out of those transactions where time was granted are important for their consequences. That portion of the balance of payments due America which was funded into long-term debt produced a definite but not immediately urgent situation. The unfunded balance, exposing holders to the consequences of day-to-day events, became the focal object of apprehensive attention. How much was this balance? Any estimate must begin with an attempted measurement of those items of which it is the complement or residual. While no month-to-month cumulative total of such items is obtainable, one can, however, record many of the sums which, during the two- or three-year interval following the armistice, worked toward the reduction of that net unfunded balance.

During the war the United States government advanced \$7,007,115,000 in funds to the allied governments out of an authorized 10 billions.²⁶ Part of such advances were secured, the rest unsecured. It had been intended that the practice of advancing funds would cease with the war's end, whenever that should be; but after the armistice it became apparent that reconstruction needs were as urgent as war demands, so the advances were continued. The government's post-armistice advances to other governments ended September 28, 1920, bringing the total advances up to \$9,466,283,000—an increase after the war of 2,389 millions. Of this latter amount, 295 millions represented accrued interest, which was funded. The bulk of these post-war advances were made during 1919. According to the estimates of the cumulative total of government advances, it appears likely that 242 millions were made available before the end of 1918, that 2,328 millions were credited to the first 11½ months of 1919, and that thereafter repayments exceeded advances. The Federal Reserve Board²⁷ estimates the 1919 figure as 2,375 millions and the 1920 as 305 millions. Earlier the Board published a summary which had been "officially computed," showing that direct advances by the government amounted in 1919 to 2,380 millions. At the same time the Board, in presenting the summary, stated that "it is probably not generally realized that during the past year in various ways the Government of the United States has made available to European countries something like \$4,000,000,000, or since the armistice considerably more than that."²⁸ It may be useful to reproduce the schedule (Table 4).²⁹

This schedule introduces the means (other than direct cash advances) by which the government was able to transfer additional purchasing power to Europe: sale of goods on credit, army

²⁶ Harvey E. Fisk, *The Inter-Ally Debts* (New York: Bankers Trust Co., 1924), p. 240. I am indebted to this source for many of the figures used in connection with the United States government advances.

²⁷ FRB, November, 1921, p. 1263.

²⁸ *Ibid.*, March, 1920, p. 214.

²⁹ This schedule had first appeared in Secretary Glass's letter dated January 28, 1920 (*ibid.*, February, 1920, p. 137).

maintenance abroad, relief purchases and transfers, and funding of accrued interest. Since the table was offered without descriptive comment, we cannot be certain that the figure of 736 millions for foreign-currency purchases represented a net balance. Nor can we be sure for just what account the expenditures were made. The maintenance of our army presumably consumed most of it. This summary is impressive, if we are safe in assuming that there is no overlapping of accounts and that it represents a strictly net external extension of funds. The accrued interest funding, while

TABLE 4

Direct advances.....	2,380 millions
Funds made available to those governments through the purchase of their currencies to cover our expenditures in Europe.....	736
Army and other governmental supplies sold on credit (approximately).....	685
Relief (approximately).....	100
Unpaid accrued interest up to January 1, 1920, on allied government obligations.....	324
Total.....	4,225

not a flow of funds, reduces the demand for dollar exchange by a like amount and therefore logically assumes the role of credit.

In considering this schedule further, it is important to observe what official attitude the government was coming to assume in answer to incessant demands both by American exporters and by foreign³⁰ countries for still more credit. Secretary Glass, on January 28, 1920, set forth the policy which was to be followed thenceforth. The government, he said,

cannot undertake to finance the requirements of Europe because it cannot shape the fiscal policies of the Governments of Europe. The Government of the United States cannot tax the American people to meet the deficiencies arising from the failure of the Governments of Europe to balance their budgets, nor can the Government of the United States tax the American people to subsidize the business of our exporters . . . nor can it look with

³⁰ On this point see statement made January 6, 1920, by Mr. Hoover on the European financial situation (*ibid.*, pp. 140-41).

composure upon the manufacture of bank credit to finance our exports when the requirements of Europe are for working capital rather than for bank credit.³¹

The War Finance Corporation and the United States Grain Corporation were also authorized to extend credit, though their sphere of activity was much more restricted than the government's credit powers. On September 26, 1919, "the Senate Committee on Banking and Currency favorably reported"³² an amendment authorizing the War Finance Corporation to extend credit to exporters if they were unable to secure credit at reasonable terms elsewhere. After about 7 months of operations on a capital stock of 500 millions held entirely by the Treasury, it had applied only a little over 50 millions to the financing of exports.³³ The secretary of the Treasury suspended its export-financing powers on May 10, 1920, saying that, in so far as business was then prosperous and involuntary unemployment negligible, the purpose for which it had originally been given special powers was gone. It had been revived, he said, because "after the armistice . . . business had suffered a recession in consequence of the cancellation of war orders, and . . . there was a fear that exports might decline and unemployment exist."³⁴ Secretary Glass, on January 7, 1920, recommended that the United States Grain Corporation "be empowered to purchase, sell, and deliver food and relief supplies for Europe up to the amount of \$150,000,000, and that for the supplies so furnished credit may be extended by the Grain Corporation."³⁵ In March the Corporation was authorized to sell 5 million barrels of surplus wheat flour and took steps to do so.

The agencies next removed from government auspices were those corporations formed under the Webb-Pomerene and Edge acts. This enabling legislation authorized the formation of corporations to grant loans on exports out of proceeds derived from sale of capital stock. This was in imitation of the successful Brit-

³¹ In a letter to the president of the Chamber of Commerce of the United States in connection with a proposed international financial conference to be held in Europe (quoted in *ibid.*, March, 1920, p. 215).

³² *Ibid.*, October, 1919, p. 966.

³³ *Ibid.*, June, 1920, p. 562.

³⁴ *Ibid.* The W.F.C. was revived again January 4, 1921 (see *ibid.*, February, 1921, p. 137).

³⁵ *Ibid.*, February, 1920, p. 144.

ish trusts which had long employed this method. On March 29, 1920, the American Bankers Association announced plans to establish a corporation under the Edge Act capitalized at 100 millions.³⁶ By February, 1921, the corporation had still done no business, and it appeared that the idea did not find much favor among American investors.³⁷

The next avenue to the reduction of unfunded balances was through the flotation in the United States of foreign long-term loans. The estimates compiled by the Guaranty Trust Company show a total of such issues outstanding in the United States at the beginning of 1919 equal to 2,163 millions. They include government, state and municipal, and corporation loans of longer term than a year. On July 1, 1920, the total stood at 2,222 millions, a net increase of 59 millions.³⁸ New foreign loans floated in the United States from November 1, 1918, to September 1, 1920, amounted to 760 millions.³⁹ But, since in approximately the same interval the total outstanding had increased but 59 millions, it follows that close to 700 millions must have been offset by maturing obligations, even though but a small fraction of the new issues were for refunding purposes. By June 1, 1921, the total had reached 2,396 millions—an 11-month net increase of 174 millions,⁴⁰ during which time possibly 560 millions in new issues were floated. The net private investment of American capital abroad—i.e., the acquisition of equities and the purchase of foreign internal securities—was set at 785 millions for the 33-month interval ending September 30, 1921.⁴¹

³⁶ *Ibid.*, April, 1920, p. 343; also February, 1921, p. 137 (named the Foreign Trade Financing Corporation).

³⁷ H. G. Moulton and J. F. Bass, *America and the Balance Sheet of Europe* (New York, 1921), pp. 304-7.

³⁸ *FRB*, January, 1919, p. 33; also July, 1920, p. 688.

³⁹ *Ibid.*, September, 1920, p. 901.

⁴⁰ *Ibid.*, August, 1921, p. 942. Professor John H. Williams in the *Review of Economic Statistics Supplement*, June, 1921, states that maturing loans exceeded new issues in 1919 by 79 millions and in 1920 by 65 millions (p. 188). This does not seem to accord with the Guaranty Trust Company's statements.

⁴¹ *FRB*, November, 1921, p. 1263. The Federal Reserve Board accepted Professor Williams' estimates of 300 millions for 1919 and 235 millions for 1920. The Board set 250 millions as the total for the first three quarters in 1921.

Still another group of items which tends to alter the unfunded credit balance are those transfers made under such headings as interest payments, tourist and immigrant remittances, and the return of American securities and currency. In its estimate of the unfunded credit balance accumulated in the 33 months beginning 1919,⁴² the Federal Reserve Board set the net interest payments receivable by private individuals in the United States at 335 millions. Payments receivable for ocean freight service amounted to 410 millions. The return of American securities and currency totaled 221 millions. Four tourist expenditures and immigrants' remittances, coupled with relief, the Board accepted the estimates made by Professor Williams through 1920 and, adding its own for the next 9 months, set their total at 1,925 millions.

During October, 1921, the Federal Reserve Board was able to make known the net balance on open bank account owing to foreign proprietors at the end of 1918. This sum was 822 millions.⁴³

In September, 1920, the Board estimated that the "unfunded international balance in favor of the United States had accumulated since the armistice to the amount of some 3,000 millions." But the computation then was made without allowance for bank balances due foreigners. The Board re-estimated the international balance as of October 1, 1921, arriving at the total of 2,708 millions.⁴⁴ At the same time the balance at the end of 1919 was placed at 471 millions and, a year later, at 2,203 millions. The October, 1921, balance, the Board said, ought to be increased by 700 millions, this sum growing out of two additional items: (1) an estimated European settlement on account of canceled war contracts estimated at 500 millions and (2) the transfer of de-

⁴² *Ibid.*, November, 1921, p. 1263.

⁴³ *Ibid.*, p. 1262; also December, 1921, pp. 1400-1412.

⁴⁴ It is interesting to note the relative closeness of Professor Williams' and the Board's estimates of the net unfunded balance accumulated during 1919 and 1920: 2,673 millions as against the Board's 2,203 millions at the end of 1920 and 2,708 millions as of October 1, 1921. Professor Williams, however, asserts that an estimated "unfavorable" net unfunded balance, accumulated from July 1, 1914, to December 31, 1918, of 2,057 millions must be subtracted from the 1919-20 figure, thus leaving on January 1, 1921, a favorable net unfunded balance of 616 millions (*op. cit.*, p. 203).

posit balances by far eastern banks from London to New York, amounting to 200 millions. This total—3,408 millions—the Board presented with careful deference to the “wide divergence of opinion [prevailing] among students of the existing balance of trade situation,” which had produced estimates ranging from 600 millions to 4,000 millions. That the Board had faith, however, in the rough adequacy of its figure is shown by its disinclination to alter it. In carrying the balance forward over the last 3 months of 1921, during which debits about equaled credits, the Board reaffirmed its earlier judgment in concluding that “it seems fair to take 3,400 millions as the approximate amount of our unfunded international balance on January 1, 1922.”⁴⁵

While this balance discloses our relative world-position, it does not reveal the true relation of the United States to Europe. To the extent that our unfavorable balances with other countries were unfunded (and there is no logical surface reason for supposing them otherwise), our “favorable” unfunded balances with debtor nations would be increased by that amount. In so far as the Board might have failed to take into account all the 736 millions of the government’s purchase of foreign currencies to cover its European expenditures and 685 millions for government-service supplies sold abroad on credit, Europe’s estimated unfunded debt would be reduced. But there is no telling into what specific accounts this 1,421 millions was distributed and, hence, no indication of what, if anything, was omitted in the Board’s estimate. Offsetting such possible omission is the net amount of those capital loans floated in the United States for the account of other than European countries.

While it is thus impossible to assay the net balance against Europe with more than doubtful approximation, it is probable that it was more than 3,400 millions, possibly nearer 4,000 millions in the third quarter of 1921,⁴⁶ the figure at the end of 1920 between 2.9 and 3.2 billions, and at the end of 1919 between 1.1 and 1.7 billions. One of the contributing factors to such a rise in the unfunded net balance was the irregular but persistent fall in

⁴⁵ *FRB*, February, 1922, p. 128.

⁴⁶ But see Williams, *op. cit.*, p. 212.

our own favorable trade balance, which amounted to about $3\frac{2}{3}$ per cent a month throughout the period, rather than in a decrease in funding operations.

The huge amounts thus held in suspense created a situation charged with danger. There is no indication whatever as to the distribution of these credits with respect to the manner in which they were carried. The banks, in one way or another, could well be supposed to have shouldered most of the burden, directly through loans to American exporters or through the purchase of foreign bills and indirectly by granting or renewing credit lines to American firms obliged to carry foreign buyers on extended open-book account. Nevertheless, at least three other means of assuming the excess burden of short-term obligations gained expanded usage during the period. One of these was the practice whereby, under a "participation agreement,"⁴⁷ goods were shipped to a foreign distributor and the profits of the sale were participated in jointly. Except for the fact that here the agreement covered only a specified transaction, it was not radically different from the acquisition of equities through stock ownership, which many American firms worked out with their foreign buyers, who lacked working capital for the purchase of raw materials. Also, when the internal depreciation of the standard money failed to keep pace with that of the external or exchange rate, many American firms found it an advantage to send materials abroad for fabrication.

A factor which did not appear in the net unfunded balance, yet which would tend to reduce it, was the acceptance by exporters of payment in foreign currencies—these amounts, usually in bank balances, awaiting more favorable exchange rates to be transferred home. Finally, the large but indeterminable purchase by speculators of depreciated currencies provided dollar exchange for debtor-nations. These last two items, although sometimes temporarily aiding weakened currencies, hung large sums over the market which might be dumped at any moment, causing embarrassment to debtor-countries as well as those trying to aid in stabilization.

⁴⁷ *FRB*, November, 1921, p. 1264.

Under normal conditions a large unfunded balance might well be extinguished by settlements within the established course of ordinary procedure, whether through the self-liquidating nature of such debts, a self-correcting shift in the balance of trade, or external capital investments. But, with the removal of control, exchange rates crumbled, thus producing a situation which would not wait upon time, yet intensifying both the urgency and the difficulty of such settlements. In view of the extraordinary weight attaching, in the public mind, to foreign trade during this particular episode, it is well to review, briefly, the unusual developments in foreign-exchange rates and the circumstances surrounding them.

FOREIGN-EXCHANGE RATES

In order to facilitate the ready acquisition of war supplies in the United States by the Allies, exchanges were pegged. When these restrictions were removed⁴⁸ between March 19 and April 8, 1919, the pound and franc were depreciated by less than 10 per cent, the lira close to 20 per cent.⁴⁹ As support was withdrawn, the principal European exchanges began their disastrous sweep to the level of depreciation already found by the internal moneys. The rates, long fixed but now released, were merely rushing to equate the purchasing-power parities of the several currencies to the dollar. The extent to which the arbitrary rates were out of line is evidenced by the intensity of the ensuing adjustment.

⁴⁸ *Ibid.*, April, 1919, pp. 311-12; June, pp. 525-26.

⁴⁹ The highest rates for sight drafts quoted in New York on the various world-centers during March, 1919, are given as percentages of par in *ibid.*, 1920, pp. 1159-61, as follows:

London.....	97.77	Amsterdam.....	102.30
Paris.....	94.82	Stockholm.....	105.04
Milan.....	81.45	Buenos Aires.....	106.11
Yokohama.....	102.31	Shanghai.....	174.07

No discussion of the exchanges of the Central Powers will be given, on the grounds that they did not play a crucially important part in the very early post-war trade with the United States. Although the State Department announced on July 15, 1919, that, with the exception of a few stated imports, restrictions on trade with Germany had now been removed, trade relations were not fully settled until the treaty of peace was signed, August 25, 1921.

There is in this maladjustment and its gradual correction (which extended roughly to the end of 1919) an enlightening hint which helps to explain the vast outward movement of American goods during the first half of that year.

By dividing the estimated purchasing-power parity⁵⁰ by the current exchange rate, one obtains a figure which, for lack of precedent, may be called an "index of gravitational pull" on the products of one country in the direction of another. From an American viewpoint an index below 100 indicates the theoretical

TABLE 5*
MOVEMENT OF THE PURCHASING-POWER PARITY-EXCHANGE-
RATE RATIO

P.P.P. Exchange Rate	Jan. 1919	Date When 100 Reached	Drift Thereafter
Great Britain....	90	Dec., 1919	100 ±
France.....	60	Dec., 1919	{ Up to 136, Nov., 1920 Never below 100
Italy.....	75	Aug., 1919	{ Up to 157, Oct., 1920
Netherlands.....	75† (Year)	Sept., 1920	{ Down to 100 ± in Mar., Apr., May, 1922 100 ±
Sweden.....	50†	Nov., 1922‡	.....

* Made up from data given in U.S. Congress, Senate, Commission of Gold and Silver Inquiry, *Foreign Currency and Exchange Investigation* (Sen. Rept., pursuant of Res. 469 [67th Cong.]), Vols. I and II by John Parke Young (9th ser.; Washington, D.C., 1925).

† My estimate; Netherlands: 1918 = 62.

‡ Except February, 1920 = 100.1, using Federal Reserve Board Wholesale Price Index and Kom-mers-Kollegium Price Index.

advantage foreigners possess in the purchase of American goods as against the same amount of funds applied to domestic purchases. An index of 100 indicates no advantage and one of more than 100 a disadvantage. Table 5 is illuminating.

While these figures are not influenced by such obstacles to the flow of goods as tariffs, quotas, embargoes, bounties, etc., they nevertheless reveal the immense gravitational pull which favored American exporters in 1919 and account, partially, for the huge trade balance then established. Furthermore, but to a smaller ex-

⁵⁰ E.g., $\frac{\text{U.S. wholesale price index} \times \text{Par of exchange}}{\text{English wholesale price index}} = \text{Purchasing-power parity (P.P.P.)}$.

tent and with less uniformity, they add light to the trade crisis in the closing months of 1920. The purpose of this section is to describe the movements of some of the more important exchanges, citing certain significant factors antecedent to the principal turning-points, and to indicate the conflict within our own attitude toward foreign trade and its financing.

Comparison of the various series is facilitated by setting March, 1919—the month when the pegs were for the most part withdrawn—as the base. But in this there is likewise some hazard, visually, for the relative movements since that month do not disclose the extent of the preceding movements.

Two things stand out as a result of even the briefest inspection of the relative European movements. First, as might be anticipated, there appears to be a rather sensitive interaction between the wholesale price and the exchange series of a given country, although the trends may be more or less divergent. Especially is this true in the cases of France and Italy, less so in those of England, Sweden, and Holland. Next, the same rough pattern, neither cyclical nor seasonal, is present in all the exchange series (excepting October, 1919, and the 8 months following in Amsterdam). This pattern traces a rise in dollar exchange throughout 1919 and the setting of three peaks falling within 1 or 2 months of March and December, 1920, and September, 1921. Since these experiences were common to a group of countries, variously separated as to internal conditions and freedom of fiscal policy, it might be assumed that such perturbations were due to causes arising in the United States. It is more probable, however, since London is the clearing house for European exchange transactions, that they reflected in most cases changes in the English-American relationship.

It is fairly settled that the fall of the external purchasing power of the various European currencies accompanied their respective internal depreciation, which, in turn, was associated with governmental use of bank credit to finance continuing deficits.⁵¹ This generalization is probably true with respect to trends. It is not

⁵¹ International Secretariat of the League of Nations, *Currencies after the War* (August, 1920), *passim*.

so certain just what the influence of fiscal policy is upon cyclical and less than cyclical turning-points in the price level. Students' opinions concerning the latter issue devolve upon the point of view with which they begin. The interrelationships of prices, production, and monetary policy have received such extensive attention elsewhere that it is necessary here only to record such series and events as will facilitate temporal comparisons with those intra-industry experiences which are properly the subject of this essay and to draw a rough framework in which the problem of export financing was set.

Exchange demoralization, beginning in March, 1919, continued throughout the year, failing to improve even when theoretical parities were reached and passed. The factors which contributed to this condition were many. The United States government withdrew in June-July, 1919, from export financing by curtailing grants of funds to foreign governments,⁵² although some credits previously authorized and still unused were drawn upon. This action was not popularly received among some segments of American industrial, commercial, and banking interests; in fact, one of the most recurrent themes in the trade literature of 1919 and following is that of importuning the government to supply sufficient funds either to stabilize the exchanges or to finance or guarantee payment on export movements. This note stems from what then appeared as an irreconcilable conflict of ends desired. The conflict may be summarized in a sentence or two. The country most earnestly desired lower prices. At the same time it feared depression and unemployment which a failure to uphold the then present rate of production would entail. A high export rate seemed a partial solution.

With the mid-1919 governmental withdrawal, banks and private firms were obliged to assume the risk of moving goods into foreign-trade channels. That it was a high risk became more apparent daily. As the dollar gained against other currencies, banks were forced to "hedge" their "discounts and purchases of foreign bills" by selling a "corresponding amount of foreign currency which [was] to result from the paper offered them when such

⁵² See Williams, *op. cit.*, p. 185; also *FRB*, 1919, p. 611.

paper [had] matured."⁵³ Accompanying the dollar's strength came also the realization that more lenient credit terms must be granted but that, if granted, they would tend to tie up earning assets for too long a period. So the banks were urged to avoid such commitments. Hence, early in 1919, there began a campaign to interest the private investor in financing exports on a long-term basis by placing his savings in investment trusts organized, like British trusts, to grant such credits. This campaign was to last, with increasing vigor, throughout the period under survey, and we shall have occasion to refer to it again later. But the public could not be brought into this sort of an investment market. Hence, the work of providing credit remained for the banks and exporters.

The next factor of American origin which contributed to the steady weakening of outside currencies was the monetary policy pursued by the government and the Federal Reserve Board in co-operation. On June 9, 1919, the Federal Reserve Board announced that the "control heretofore exercised over transactions in foreign exchange and over the exportation of coin, bullion, and currency would be terminated,"⁵⁴ and we were once more on a true gold standard. Professor Cassel levels one of his two major criticisms at the Federal Reserve Board for its failure to stabilize prices at this time.⁵⁵ Instead of curtailing the use of credit by means of higher interest rates, the Reserve banks—and especially the New York Bank—held the rates "absurdly" low, on the excuse that the government fiscal operations required an easy market. Indeed, on June 1, 4.5 billions were allotted of the 5.2 billion subscription for the Victory Loan. But the Board, complains Cassel, permitted a rise in prices extending from then to May, 1920, and amounting to about 20 per cent. The ill consequence of this, since the price of gold was coming to move within a range of 0.5

⁵³ *FRB*, June, 1919, p. 525.

⁵⁴ *Ibid.*, July, 1919, p. 615. Applications and licenses for specie export were dispensed with on June 30.

⁵⁵ Gustav Cassel, *Money and Foreign Exchange after 1914* (London, 1922), pp. 187–203. It is not clear whether he meant that stabilization efforts should have begun in March or June.

per cent of dollar exchange on the London market,⁵⁶ was to hide from European nations the true dimensions of their own depreciation, hence increasing the already difficult task of bringing about internal financial order. In addition, dollar depreciation carried the value of gold lower with it and made the little metal supply still held by central banks even less effective. Professor W. A. Brown⁵⁷ sets forth a somewhat similar view.

In the fall of 1919 price rises abroad continued along with increased governmental borrowing and larger note circulations. Exchanges accompanied the internal depreciation and American bankers began to examine in person the plants and credit standing of foreign debtors. It was evident that, as exchanges grew weaker, the burden of payment became heavier. And, as pointed out by the president of the British Board of Trade, the more America exported, the worse the exchanges moved against the possibility of more exports.⁵⁸ In studying the quality of credit risks, bankers were faced with the problem of making a careful distinction between working- and fixed-capital needs, for the latter was a dangerous employment of commercial banks' necessarily short-term earning assets. Furthermore, in the interests of national policy it was probably better to aid Europe's return to productive efficiency, for we could expect only goods to extinguish the huge debts already held on this side, and this almost certainly required investment capital in the majority of cases. Our own efforts to engage the interest of the private investor emerged eventually under the Edge Act of December 24, 1919, which, as noted in the preceding section, was surprisingly barren of results.

That the credits demanded were long term, whatever the use to which they were finally put, is indicated by the practices of the British government in guaranteeing export credits with a time allowance of six years. This was authorized under the "trade facilities bill" and assured exporters up to 85 per cent of the sales price and banks up to 70 per cent of losses incurred.⁵⁹ Great Brit-

⁵⁶ *FRB*, June, 1921, p. 681.

⁵⁷ *England and the New Gold Standard, 1919-1926* (London, 1929), p. 100; also chaps. iv and v, *passim*.

⁵⁸ *FRB*, November, 1919, p. 1011.

⁵⁹ *Ibid.*, December, 1921, p. 1420.

ain had long since learned the necessity of external investments. America, suddenly thrust into the position of a leading world-creditor, was neither adept at foreign-credit analysis nor inclined to send her capital abroad. Both these characteristics are important in the results they produced. If it was industrial capital that Europe's rehabilitation depended upon, the American investor was reluctant to provide it without the intermediate indorsement of a government. In addition, such moneys as were granted for the purpose of acquiring stocks of goods in one stage or another carried either the provision or the recommendation that they were to be expended at home. Many banks, after their first discouraging entry into foreign fields, rapidly closed their foreign branches in 1921, surfeited with their role of international creditor. Nevertheless, enough credit was provided—mainly by the government, whose advances in 1919 covered the record-breaking balance piled up in the first half of the year—to keep exports at an extremely high level. Europe was unable to secure a favorable balance with us, and this militated against strengthening her exchanges. On the other hand, South America and the Orient enjoyed favorable balances; and their exchanges reflected the stabilizing effects of gold imports, excepting, of course, China, whose exchange rates (Hongkong) followed the price of silver so closely as to leave no room for any other factor to account for the remaining discrepancies. Her price level moved almost horizontally, with a very slight upward bias terminating in March, 1922. Japan, it is noteworthy, provides an interesting exception to the typical behavior of prices and exchange rates observed in the European countries. Wholesale prices in the year following March, 1919, rose almost 5 per cent a month, whereas dollar exchange, while moving in sympathy even at the downturn, rose but slightly, crossing par in December. This experience has been attributed to the tremendous export prosperity enjoyed by Japan during the war and to the speculative activity thereby engendered. More is said upon this subject in the section on silk. It is to be noted in passing, however, that, although the note circulation of the Bank of Japan increased by 21.7 per cent between June, 1919, and the following March, the specie reserve ratio also climbed from 65.3 to 67.3 per cent in the same interval.

Meanwhile, in America, opinion was crystallizing into policy. Faced with rapidly rising prices and an almost universal popular protest against them, which continued throughout the latter half of 1919 with mounting intensity, those with responsibility in shaping monetary policy became more articulate and took definite positions respecting foreign and domestic credit. Secretary Glass's annual report to Congress for the year 1919 made it perfectly clear that the government did not intend to force the dollar down in world-exchange markets in order to provide the American exporter a competitive advantage at the expense of burdening the rest of the population with increased prices. It has been observed by many writers that the government's policy of maintaining low Federal Reserve rediscount rates (for the purpose of enabling the Treasury to carry on its vast borrowing program with the inevitable inflationary effects such paper is bound to produce) makes the government's campaign against high prices lack either grace or wisdom. Whichever it was, the teamwork between the Treasury and the Reserve Board was to last but a month longer, for in January, 1920, the Reserve Banks were released to set their policy independently, the Treasury deciding to do the best it could at the market rates.⁶⁰ One is inclined to believe that Professor Cassel's criticism did not allow sufficiently for the Board's subjugation to the government. The Board did, as a matter of fact, look with disfavor upon the expanding use of credit that it saw but was unable to use more than moral suasion as a means of control. As early as June, 1919, the Board began asking member-banks what use their customers were making of funds obtained through rediscounts. Even in April of that year the Reserve banks were cautioning members against tying up assets in what might develop into long-term loans abroad, recommending at the same time that export financing be undertaken by individuals with savings so that short credits might not become unduly expanded.

As soon as the Board was able to establish policies independently, it did begin to set rates higher, slowly at first it must be admitted, but it could not, even with its new freedom, proceed

⁶⁰ B. H. Beckhart, *The Discount Policy of the Federal Reserve System* (New York, 1924), p. 337; also chap. vii, *passim*.

with total disregard of the interests of those whom it had so lately helped to become holders of government bonds. In September, 1919, it had begun what was later to be regarded among authorities as a mistaken policy of trying to discourage loans upon "non-essential" undertakings, thinking thereby to keep credit available for essential uses without burdening such enterprises with a flat rate increase. Curiously, the production of anything for export markets was accepted as "essential" on the grounds that it helped in the industrial reabsorption of returning soldiers.

The secretary's declaration of policy in his annual report was evidently made in answer to the insistent clamor throughout almost all of 1919 that the government do something about the exchanges. His attitude received a much wider dissemination, in this case reaching not the congressional attention for which his report was intended but the commercial and industrial interests instead, through his letter of January 28 to the president of the United States Chamber of Commerce, from which quotations were given in the preceding section.

With this definite position taken by the government and with the attitude of the Reserve Board crystallizing into an active policy, the dollar grew rapidly stronger against other moneys in December and in January and February, 1920. The fact that the principal cause of the weakened state of European moneys rested more on fiscal policy than on trade balances was gradually reaching governmental minds is evidenced by the general acceptance of the Cunliffe Report as finally submitted to the British Treasury on December 18, 1919. However, Great Britain appeared to be the only country either willing or able to take the lead in acting upon the recommendations of the report.

Before such steps were taken as would produce objective results in the external status of the pound, the rates of all European currencies gave way rapidly. The March issue of the *Federal Reserve Bulletin*⁶¹ described the situation existing during January and February as follows:

There has been a certain congestion of goods in warehouses or storage, owners determining not to continue shipments abroad in view of the unfavorable quotations of foreign currency and the difficulty of financing the

⁶¹ See p. 217.

products which they had been in the habit of shipping. A natural consequence of this tendency to retain goods at home has been a curtailment of certain classes of prices. The reduction is thus far only sporadic, but unmistakable symptoms of it have already been noted in various commodities. . . .

Quite as powerful as the influence of unfavorable exchange quotations, and directly associated with the latter, has been the tendency of American banks and banking houses during the month of February to limit the accommodation which they had been lending in financing the movement of goods to other countries. In several different ways this growing disinclination on the part of banks to become responsible for export conditions has been exhibited. . . . Early in February various banks in New York and elsewhere indicated to customers an indisposition to discount bills drawn in dollars and growing out of trade with Europe.

This stage in the gradual withdrawal of banks from the export field is significant. With the first fall in foreign currencies the banks had shifted to dollar obligations and thus placed the exchange risk on banks overseas. The present shift indicates their fear that foreigners would be unable to meet dollar payments when due. Hence, if exports were to be financed—and, by the all-time record established in 1920, it appears that they were—then the practice of granting credit on the shipper's own obligation must have become conventional at this time. The American exporting firm, either as a producer or as a distributor, thus became the real carrier of the inordinately heavy unfunded balances and the risks attending them. The banks, to be sure, were called upon to provide the necessary amount of credit, but dishonored bills were charged against the shipper's assets in one manner or another.

The risk inherent in fluctuations in exchange rates was not the only troublesome element now in process of development, as shown by the following statement:

"Early in February, 1920, it was reported that many British importers had ceased to buy further American cotton and had even shipped some back." This was not because the cotton was not badly needed, but because it could not be converted and sold at a profit under the existing price relationships and at the existing exchange rate.⁶²

The first substantial check in the progressively deteriorating exchanges came on March 8, 1920, with the announcement in the

⁶² Brown, *op. cit.*, p. 64. Inner quotation from Samuel Montagu & Co., *Foreign Exchange Letter*, February 5, 1920.

House of Commons by Sir Austin Chamberlain, chancellor of the exchequer, that Great Britain's half of the Anglo-French loan of half a billion dollars due the United States on October 15 would be paid at maturity. "We shall employ for the purpose resources already available or in sight in the United States, and to the extent that they are not sufficient, we shall ship gold,"⁶³ said the chancellor. Led by the pound, most of the exchanges improved immediately. The improvement had really started before the announcement when, as was now known, the government had completed its accumulation of dollars sometime in February.

The franc improved slightly in March, only to slip further in April. French finances were not strong enough to take up the Anglo-French loan along with Great Britain, so a new loan of 100 millions was arranged, to be floated in New York in September. Both the franc and the lira, closely associated by intergovernmental loans, showed strength in May through July, as did all the other currencies. In addition, internal depreciation seemed to be checked. Whether this was due to the chain of events following England's action in handling the Anglo-French loan, in establishing a maximum for currency-note issue at home, and in providing a budgetary surplus for debt retirement is not certain. Prices of certain basic materials had already turned downward by March. Events of fiscal policy and those having their place in world-markets came with such simultaneity that it is impossible to establish priority among them. Nevertheless, the experiences of March and April, whatever their antecedents, saw the end of the post-war upward rush of prices.

The uncertainty caused by the delay in reaching a reparations agreement with the Central Powers and the open conflict between Russia and Poland, carrying as it did the fear of another general outbreak, aided in again depressing European exchanges in the fall of 1920. The resumed fall of the pound, beginning in August, was probably due to the combined effects of a group of incidents. In America the War Finance Corporation, which had supplied fairly liberal amounts of long credits for cotton and grain export, was suspended on May 10. Because of unsettled affairs in Russia,

⁶³ 126 *H.C. Debate*, 1920, p. 910; see also Brown, *op. cit.*, p. 66.

shipments of wheat from that source could not be depended upon with certainty. Hence heavy demands were made upon dollars for commitments covering necessary milling operations. In addition, English coal miners voted on September 23 to go out on a strike which, becoming effective October 16, stopped the production of coal until November 8.⁶⁴ Both British firms and those in countries which depended upon England for their coal supplies turned to America, with the result that further heavy demands were placed upon the dollar.

By this time (November-December, 1920) prices were far along in their radical drop from May peaks. The inflow of gold, which began, curiously, at the peak of prices, was continuing with increased acceleration; yet its natural inflationary effects were lost on the price movement then under way. Professor Cassel⁶⁵ again blames the Federal Reserve banks, this time for "senselessly" allowing the value of the dollar to mount and hence increasing the purchasing power of world-gold, besides setting at naught the recent attempts of England to bring the pound, if not to par, at least to a stable relationship with the dollar. With respect to England's difficulty on the latter point, Professor Brown⁶⁶ concurs. But one cannot be certain that the means at the disposal of the Federal Reserve System were powerful enough to reverse the precipitous price movement, once it had begun to undermine the inflated price structure.

To add to the manifold troubles already besetting Europe's currencies, liquidation in the states prompted many exporting firms, which held balances abroad awaiting favorable rates for their transfer, to dump them on the market without regard to the demoralization that such action was helping to produce. Funds at home were scarce, collections were slow, and creditors were making insistent demands. Furthermore, new foreign orders were disappearing, and cancellations both of those orders in production or of those already shipped were approaching panic dimensions.

While we have thus far been concerned principally with Euro-

⁶⁴ *FRB*, November, 1920, p. 1198. The strike broke out again in April, 1921, and continued until July 4 (see *ibid.*, 1921, pp. 552, 952).

⁶⁵ *Op. cit.*

⁶⁶ *Op. cit.*, p. 100.

pean exchanges, largely because they involved over half of our export volume, events which had been leading to a collapse of trade in other directions also deserve attention for their contribution to the November-December debacle. In Cuba, on October 10, 1920, President Menocal declared a moratorium to stop the panic then in progress following radical price drops in sugar. Various South American countries, likewise depending upon an export market for such basic raw materials as they produced, were also obliged to declare moratoria or near-moratoria when prices fell violently and foreign demand vanished. They were left without the means of obtaining exchange. Concomitantly, American goods began filling all available space in many South American warehouses,⁶⁷ refused for reasons ranging from inability to export specie or other means of payment in violation of temporary government regulations to declines in producers' prices since orders had been placed.

South American countries had experienced general price rises in sympathy with other countries, even though they were not obliged to make "special expenditures for military purposes."⁶⁸ Exchange rates in Argentina, perhaps typical of many South American countries, did not give way until July, 1920, when the fall in the world-prices of her two principal export products—beef and hides—had reacted seriously upon her ability to obtain balances abroad. Unfortunately, no index of Argentinian prices is available for comparison with the movement of exchange rates and with variations in foreign price levels.

That exchange-rate fluctuations and the financial risks attending them were as much the result of changes in the international political scene as of purely economic considerations had been demonstrated several times since the close of the war, and the truth of this proposition was now to receive one more clear-cut confirmation. On January 29 the Conference of Allied Premiers, long meeting in an attempt to settle the German reparations payments, made a preliminary announcement of its agreement: that 3 bil-

⁶⁷ *FRB*, 1921, pp. 6, 9, 135, 267, 509, 645, 905.

⁶⁸ International Secretariat of the League of Nations, *op. cit.* (quoted in *FRB*, 1920, p. 898).

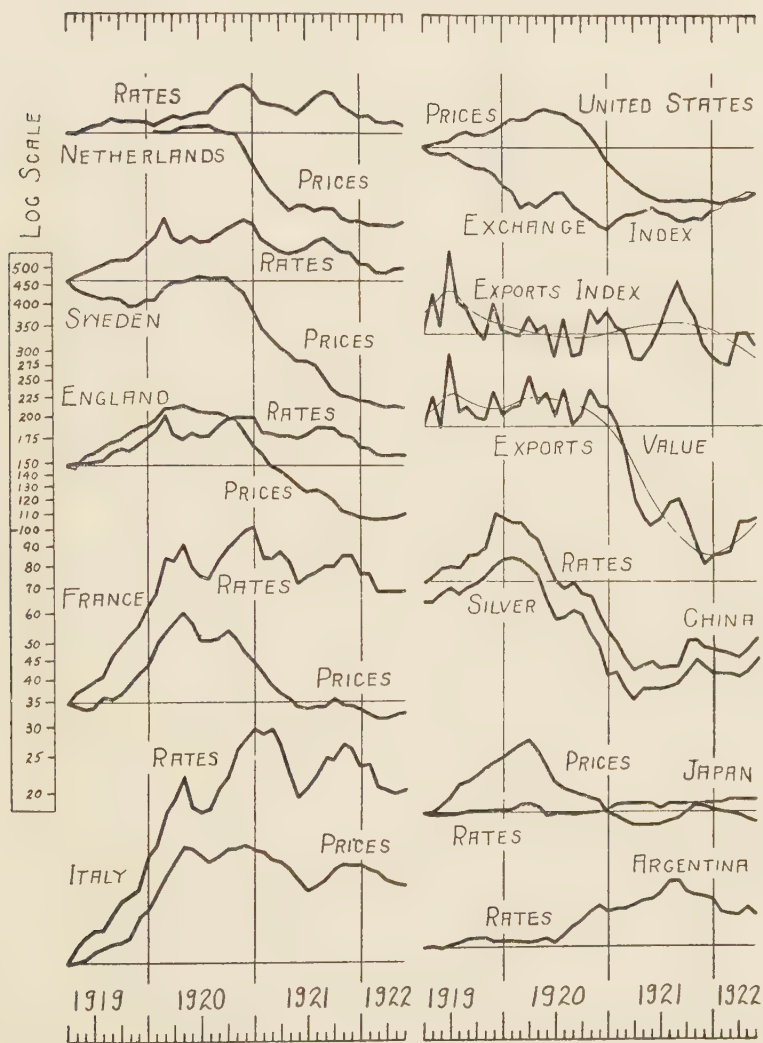
WHOLESALE PRICES AND FOREIGN-EXCHANGE RATES ON NEW YORK*

	United States: U.S. Bureau of Labor Statistics, index of wholesale prices.
Netherlands, Amsterdam: Florins per dollar.	
Netherlands: Central Bureau of Statistics, index of wholesale prices.	United States: Foreign Exchange Rate Index, <i>Federal Reserve Bulletin</i> , October, 1922, pp. 1260-61.
Sweden, Stockholm: Kroner per dollar.	
Sweden: Svensk Handelstidning, index of wholesale prices.	United States: Foreign Trade Index. Exports of selected commodities at 1913 prices. Federal Reserve Board.
Great Britain, London: Pounds per dollar.	
Great Britain: Sauerbeck's index of wholesale prices.	United States: Value of total exports. Adjusted for seasonal. U.S. Bureau of Foreign and Domestic Commerce.
France, Paris: Francs per dollar	
France: Statistique générale de la France, index of wholesale prices.	China: New York exchange rate on Shanghai. Dollars per Shanghai tael. Silver, American Metal Statistics, monthly average of prices at New York.
	Japan: Bank of Japan, Tokio, index of wholesale prices.
	Japan, Yokohama: Yen per dollar.
Italy, Milan: Lire per dollar.	
Italy: Bachi's index of wholesale prices.	Argentina, Buenos Aires: Pesos per dollar.

* Since foreign rates on New York are not at hand, the reciprocals of New York rates on world-centers are used instead. The rates are for sight drafts through June, 1921, and the noon buying rates on cable transfers thereafter and are the highest for the month.

Foreign wholesale-price indices and exchange rates were drawn from the *Federal Reserve Bulletin*, *European Currency and Finance* (Ser. 9), Vols. I and II, and *Foreign Exchange Quotations and Curves* (Ser. 8).

CHART III WHOLESALE PRICES AND EXCHANGE RATES ON NEW YORK



lion gold marks shall be paid annually for the first 5 years, and 6 billions annually for the next 32 years. Thereupon all the former allied and neutral exchanges improved, marking the final turn, as far as the period under review is concerned, in the 21-month slide since the removal of government control.

The improvement continued until sometime between April 27 and May 5, 1921, when the final decision of the Reparations Commission was announced,⁶⁹ disclosing that bonds instead of gold marks were to be delivered, whereupon the exchanges promptly relapsed. When Germany completed bond-interest payments, under the May 5 or London schedule of 1 billion gold marks on August 31, the beneficiary exchanges improved again. But the world-wide depression was too far advanced for such belated improvements to make any satisfactory difference. No longer were exchange rates the primary risk and deterrent to the movement of goods into world-channels. Trade itself had dried up in sympathy with the fall in production and the disappearance of demand.

⁶⁹ For a summary of meetings and events in connection with the reparations payments see U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, *The Reparation Problem, 1918-1924* (Trade Information Bull. 278 [Washington, October 20, 1924]).

CHAPTER III

LEATHER AND SHOES

RETAIL AND WHOLESALE MARKETS

ORDINARILY five stages are fairly distinguishable in the shoe industry: the production of hides, tanning, the manufacture of shoes, wholesale distribution, and retail distribution. The attempt to trace the flow of materials from origin to consumer will best be served in the present case by taking up these stages of the production process in the reverse order. The reason for this is that certain major experiences in production proper found their antecedents in unusual customer behavior. The plan of this chapter, therefore, is to review the distributive processes as they reflect the buyer's changing moods; to trace the effect of these upon the manufacture of shoes; and to see how these impulses were relayed back to tanning; also to examine the counterinfluences issuing from hide-supply conditions. The tanning industry, although technically independent of shoe manufacture, cannot be considered by itself, because its fortunes are intimately bound up with those of the shoe industry, which absorbs about 75 per cent of the leather produced. The tanner is caught between two independently operating forces, over neither of which he has any control—the supply of hides and the demand for shoes.

With the release from the depressive tension of war came, naturally enough, a "mood of reaction from war economy." The relief felt at the return of physical safety at once outweighed prudence concerning personal expenditures. With the disappearance of war hazards, few other cares were significant. If life was once more secure, few dangers remained. This realization produced a carnival of personal indulgence. Frugality was not a part of the holiday spirit. Needs and fancies were satisfied. It is therefore not surprising to discover, in the increasing demand for shoes, a difference in the quality of the footwear demanded by the public.

Salesmen returning from the road reported that "there does not seem to be the slightest disposition on the part of the customer to accept solid, serviceable, staple lines of shoes. The emphasis is put on style and finish regardless of wearing quality."¹

It is a curious paradox that, with the newspapers carrying on a violent campaign against the high cost of living, the nature of the individual demand was such that factory and jobber salesmen found it easier to "sell the first quality shoes and high-priced numbers than the medium grades." As early as April, 1919, this unusual demand for the top grades, accompanied by a rapid falling-off on medium and low grades, became the subject of trade-paper editorials. The editors complained that laborers were demanding high-class shoes regardless of wearing qualities and that this placed great pressure on the relatively fixed supplies of fine skins, thus increasing prices that were already high. "Utility and economy," observed one editor, "have been succeeded by waste and extravagance. There is an irreconcilable conflict between style and wear."²

High prices seemed to be no deterrent to buyers, however; and the manufacturers complained that it was easier to sell shoes than to make them. With increasing prices came talk of a possible scarcity of shoes, so that retailers had little trouble in persuading the public to buy ahead of further price increases and to acquire an extra supply against the impending shortage. That the use of such psychological pressure was only too successful subsequent developments attested. In mid-July one writer sounded the first note of apprehension concerning the direction in which these practices were leading the shoe industry by declaring that the public was providing itself for a year ahead. What, he asked, would happen to demand then? He complained also that, at present, retailers were ordering from several more than their usual sources if delivery was slow and thus multiplying and magnifying con-

¹ *Shoe and Leather Reporter*, September 18, 1919, "Wholesale Shoe Market Section." This is one of the leading journals of the leather industry and reports weekly the conditions and developments in each stage—from hide supplies to retail shoe trade—of the productive and distributive process (hereafter referred to as *SLR*).

² *Ibid.*, September 25, 1919, p. 113.

sumer demand. Prophetic was his inquiry: "Will the retailers cancel their orders later for any reason . . . ?"³

The rapid price rise and advance buying alarmed the National Boot and Shoe Manufacturers' Association, which issued a statement deploring the fact that shoe prices, based on present costs, must be still higher during the coming spring and urging that the equilibrium of the market might be restored if manufacturers and merchants would stop buying far in advance of actual needs and buying quantities in excess of needs.⁴ Shoe prices were singled out by both press and state as leaders in the rising costs of living. In Congress, Representative Good suggested an embargo on all boots, shoes, and leather, in order to build up our own stocks and reduce prices. He added the following observation:

As long as we are engaged upon the plan of feeding and clothing the world, and furnishing all the money with which to pay for the food and clothing—we have advanced to the allies almost one billion dollars since the first of March—we cannot expect lower prices. We cannot reduce the cost of living with the United States in competition with itself.⁵

The public, however, was in a buying mood, and Chicago retailers reported the largest July turnover on record. The second week in August saw a similar record in wholesale volume. Buyers cleaned up many of the lines, and the salesmen on the road in mid-August found business, especially on the better grades, very good. Toward the end of August a rather inexplicable condition began to develop. Retail trade seemed to slacken its rate of increase, and in the first week of September ("generally considered conspicuous in shoe selling") the retailers experienced a poor volume and were considerably surprised at this "unusual condition."⁶ But the other side of the anomalous picture is that whole-

³ J. M. Montgomery, "The Future of Shoe Sales," *SLR*, July 31, 1919.

⁴ *SLR*, July 31, 1919.

⁵ *Ibid.*, August 21, 1919, p. 41.

⁶ There is only one index of retail shoe sales—that of chain shoe stores (see *FRB*, April, 1928, pp. 232-35). The index is in dollar volume of sales. It was thought possible to obtain an index of changes in the physical volume by deflating with the National Industrial Conference Board retail-price index and adjusting again for the number of stores in the chains. This produced an index which rose through August, 1919, fell sharply to December, and climbed steadily from then on.

salers found no slackening in their outlet demand, reporting that "stocks coming in were hardly sufficient to keep pace with the ever-increasing demand for shoes." One reason for this insistent demand is that they believed the retailers' stocks to be low.

By the middle of September the trade seemed to recognize a falling-off in consumer purchases. The trouble apparently had not seriously affected the top grades, but the demand for medium and cheap shoes seemed to be suffering more than the disaffection for low in favor of high grades would account for. In Boston, although it represented a depression in purely local conditions, the police strike resulted in a sharp decline in retail revenue because of theft and customer absence. (This is reported here merely because it is the first of the misfortunes to be visited on the Boston area throughout the winter.) Whether owing, in fact, to low retailer stocks or to grave misjudgment of future demand, retailers expanded and multiplied their orders for immediate and future deliveries. The eastern wholesalers reported in September that it was easy to get orders, regardless of price, but that delivery was the present difficulty. All the factories making good shoes were busy on at-once orders. In Chicago the factories were at full capacity in the fine-grade brackets.

In October and November the same conditions continued, with the wholesaler and jobber pressing the manufacturer for delivery. Much of the business was for immediate fall reorders; but the larger proportion was on spring stocks for which as early as July wholesalers insisted on placing full orders. In December, according to trade news, factories were all at capacity production. Nevertheless, it was admitted that "during the last few weeks the public bought conservatively" and that the best volume of sales had now shifted to the medium-priced shoes.⁷

The rapidly increasing prices became a source of sober concern to all branches of the industry and the future course of prices a

This result was so obviously out of line with reported experience in 1920 that the index probably better expresses the growth of an institution (that of chains) than general retail sales. The August-December decline possibly reflects truly the disaffection for medium- and low-grade shoes.

⁷ *SLR*, December 25, 1919, p. 80.

major problem. Yet there was no agreement about the outlook, as the following statements made by responsible leaders will show. On October 15 the New York papers quoted J. F. McElwain, president of the National Boot and Shoe Manufacturers' Association, to the effect that "as it required about six months for the consumer to realize any difference in cost of the raw shop materials, he expected by March, April, or May, at the latest, the cost of shoes to the consumer would again return to something like normal."⁸ Many persons believed with H. B. Endicott, president of the Endicott-Johnson Corporation, that prices would go no higher. Such was also the stated belief of the Shoe Manufacturers' Association of New York and the New York Retail Shoe Dealers' Association.⁹ On the other hand, the *Philadelphia Public Ledger* was certain that prices would be "higher in the spring and fall because manufacturers were taking orders at a price three dollars above those for which they have just made deliveries."¹⁰ In July, J. M. Montgomery had warned against overstocking the consumer. Fear that exactly that condition was not far off probably accounted for the public statement made in December by A. H. Geuting, president of the National Association of Retail Shoe Dealers, urging all people to buy fewer shoes and to "wear the ones they have until they'll no longer hold a patch!"¹¹ A month later his successor promised the nation lower prices for shoes.¹² But, on the other hand, we find one large shoe manufacturer stating:

A market shortage of workers, constantly increasing labor and material costs and a serious shortage of high-grade leather have forced the shoe manufacturers . . . into a serious problem. The cost of manufacturing shoes will advance further, and the public cannot expect lower shoe prices.¹³

⁸ *Standard Daily Trade Service*, October 20, 1919, quoted from the *New York Herald*, October 15, 1919.

⁹ *Standard Daily Trade Service*, January 17, 1920.

¹⁰ *Ibid.*, December 5, 1919.

¹¹ *Ibid.*, December 18, 1919.

¹² *New York Tribune*, January 27, 1920, quoted in *Standard Daily Trade Service*, February 9, 1920.

¹³ *New York Herald*, January 19, 1920, quoted in *Standard Daily Trade Service*, February 3, 1920; see also price forecasts made by members of the National Boot and Shoe Manufacturers' Association, below, p. 66.

While these conflicting price forecasts were appearing on every side, the wholesalers continued to do a record-breaking business, pressing the shoe manufacturers for speedier deliveries. Although there is practically no indication as to the amount of retailer stocks on hand or the amount of goods passing through their hands, opinions maturing in the twelve months following set the year-end stocks on hand at an abnormally high level, especially in the better grades of footwear, and the advance orders at about twice the usual volume¹⁴—a condition of potential disaster. Pursuant to the government's avowed purpose of reducing living costs, the army announced at the end of 1919 that it would sell 1.9 million pairs of army-inspected shoes through quartermaster retail stores. This move probably began the practice of disposing not only of shoes but of all sorts of consumer goods which the services undertook on a large scale throughout the country. Nor were the sales limited to articles of personal use; they came to include hardware, tools, and harness as well. Little remains to evidence the popular appeal these stores held for buyers except a memory of the throngs that visited them. Of course, the size of this announced offering was only about 2 per cent of the total production of men's shoes in 1919 and probably played only a small part in weakening the established market. Nevertheless, the prices set were extremely low compared with ordinary retail prices, and the shoes had an immense attraction for buyers at that particular time, since many had become attached to the quality and comfort of service footwear.

Whatever was happening in retail volume—and there are hints that it was dropping slightly—wholesalers' orders were still mounting and in the first week of February, 1920, reached an all-time high in Chicago. The ability to secure prompt execution of orders, which was already diminished by the overload of unfilled orders on factory books, was still further reduced by "tying up of transportation facilities by the freight handlers' strike and consequent embargoes."¹⁵ This delayed seriously the movement of both shoes and leather.

¹⁴ *SLR*, December 30, 1920, p. 101.

¹⁵ *Ibid.*, February 12, 1920, p. 75.

On February 5 the second misfortune was visited upon Boston: a paralyzing blizzard struck the northeastern seaboard with such severity that plants hastened to close down while it was still possible for their workers to reach home. The following day few operators dared face the storm. Production and the movement of materials halted abruptly. Trains were snowbound in the yards. The Boston area never recovered. Orders were transferred elsewhere (Chicago experienced its maximum at that time), and, when men were finally able to reach the plants, transportation still could not be thawed out. Stocks of materials, already low, were soon used up before others, delayed by coal and food embargoes, could be brought in. When the physical effects of the storm had been overcome, speculative forward buying had already passed its zenith, and the first cancellations had appeared. As late as March 11, New England was still hard hit with the tie-up of goods caused by the blizzard.

"The bottom has dropped out of the Chicago Wholesale Market."¹⁶ This statement of February 12 was the first warning of trouble. Without a preliminary sign of weakness, the market gave way; the buyers disappeared. As far as available evidence shows, it was a volume more than a price plunge. We do not know how the prices of some numbers behaved, but those which make up the Bureau of Labor Statistics index reached their peak in February and held fast through May. For reasons undeterminable except in the case of Boston, the retail market also suffered its major downthrust in the second week of February. In Chicago, stores were "passing through one of the worst slumps in business for a long time. The public has stepped out of the market for the time being, and is . . . uninterested in style or price."¹⁷ Stores began immediately to attempt to clear their stocks through sales. These sales were of the "genuine variety . . . as many of the dealers are getting 'cold feet' on some of the models which they have on their shelves." Both the recent price advances and the official pressure for lower living costs were blamed for the slump. In some quarters it was believed that the "campaign being waged

¹⁶ *Ibid.*

¹⁷ *Ibid.*

by fair price agitators and the publicity given by the daily press is having its effect, and . . . the general public is actually economizing."¹⁸

The retail-price index, it will be observed, did not reach its turning-point until March. This may be due to any one or all of the following reasons: First, it may be due to the specific grade of shoes comprising the sample. The National Industrial Conference Board cost of living index is based as far as possible on the family budget of a typical laborer. Hence the variations of short-time changes in taste do not show up. The schedule calls for price quotations on a given shoe, which may or may not be the mean object of expenditures. As a matter of fact, evidence is almost certain that consumer disaffection appeared first in the style classes so recently adopted by wage-earners. Second, since price samplings are taken only three times a year by the National Industrial Conference Board, we cannot be sure that March was not merely the first bench mark following the downturn. Third and finally, it is probably true that it took some time for the turning-point to extend throughout the country. For instance, the Massachusetts Commission of the Necessaries of Life index lagged after the National Industrial Conference Board index by two to four months throughout the period.

With respect to the lethargic characteristic of wholesale shoe prices as shown by the Bureau of Labor Statistics index, much of the foregoing might well apply. The spectacular price rise following April, 1919, is probably not well reflected in the index which, of necessity, samples staple numbers, whereas there is ample evidence that the grades demanded underwent a considerable change, with the greatest advances undoubtedly accompanying the ascendant numbers. In the second week in February this trend very probably reversed itself, with neither movement showing in the index. Also a certain amount of territorial inertia was inevitable. All this is to say that if we had a figure representing the average price per pair sold rather than the average price of certain kinds of pairs for sale, our indices would tell a different story. The best guess we can make under the circumstances is

¹⁸ *Ibid.*

that both wholesale and retail prices fell simultaneously, with "genuine retail sales" appearing, on one hand, and cancellations, on the other. But it appears that the number of shoes taken by the consumers had been slipping since September, whereas wholesale volume suddenly fell away from its February peak, the difference apparently having gone into accumulated retail stocks.

From this point on through the year, self-reinforcing or cumulative factors carried on with orthodox behavior. The public withdrew; prices fell; with falling prices the public waited for still lower prices.

Early in March the logical consequence of placing several orders for the same bill of goods began to appear and by May was assuming the proportions of a calamity. Cancellations in ordinary circumstances could be written off the order-books. But cancellations in this instance were more vicious by many fold; a large part of them were for shoes already finished and shipped but held up en route by the paralysis in transportation.

The public, in what was soon termed a "buyers' strike,"¹⁹ progressively withdrew its demand for shoes. Those which it was forced to buy became once more the medium-grade, serviceable type. In this frame of mind buyers almost literally stayed out of shoe stores until the end of 1920. Even when the public did become more inclined to buy, it wanted, as someone observed in the latter part of 1921, "a seven- or eight-dollar shoe for five dollars."

SHOE MANUFACTURE

While some experiences of the shoe manufacturers have already been noted, they are by no means an adequate account of events affecting that industry.²⁰ Soon after the armistice, government

¹⁹ See, e.g., United States Tariff Commission, *Hides and Skins* ("Tariff Information Ser.," No. 28 [1922]), p. 17.

²⁰ Monthly shoe production in 1919 and 1920 is not known. Production data, collected by the Bureau of the Census, begin with November, 1921. The returns made to the Bureau during that year included output figures for the corresponding month in the year preceding; the latter are available but not published. The several inferences to be drawn from auxiliary sources as to the month of peak production yield conflicting evidence. Leather consumption and the volume of wholesale dis-

contracts for service shoes were canceled.²¹ The demoralization thus caused, in addition to that of reconverting plant equipment to meet civilian needs, was not long lived. By April both foreign and domestic demand showed signs of vigor. The strength of demand was such that by July wholesale "buyers were not content to order spring samples only, but insisted upon placing complete case orders for next spring."²²

A runaway market had developed, and only the physical inability to produce shoes fast enough stood in the way of satisfying demand. The disappointing September retail trade seemed to have little effect upon factory orders. The customary biannual fixing of prices was disbanded, and salesmen were sent out on the road either without price lists or with instructions to take orders subject to price changes at time of delivery. Many manufacturers were not inclined even to book future orders; others were booked well into the spring.

As early as September productive capacity was found inadequate. Limits were set not only by machinery and floor space but by supplies and labor. The want of skilled operators and the inefficiency of those employees already on the pay rolls was the

tribution would place the maximum production at June and July, 1919, respectively. On the other hand, employment did not reach its maximum until December. This evidence might be seriously weakened in the case of shoes because of the entry of the style factor into hitherto unstyled grades, thus increasing the amount of labor required per pair. The weight of two other factors must be considered. A shoe and leather census taken for the first and second quarters of 1919 (reprinted in *SLR*, September 18, 1919, p. 46) shows a larger volume in the second quarter. The second half-year exceeds the first by 56 per cent. Finally, comment in trade papers, while not definitive, gives no hint of volume decline until early in February. A guess, as probable as any, is that December was the maximum output of shoes. It has been observed in most instances that the regression of output on employment during the downswing has approximated 1.0 more nearly and consistently than at any other stage. If that is reliable concerning shoes, production fell off very slowly until the end of May, when the decline was accelerated. This behavior is in nice accord with the drop in wholesale prices and with pay rolls.

²¹ See, e.g., Eugene Meyer, Jr., "The War Finance Corporation and American Business," *Proceedings of the National Boot and Shoe Manufacturers' Association* (New York, January, 1921), p. 62 (referring generally to government cancellations) (hereafter cited as *Proceedings*).

²² *SLR*, July 31, 1919, p. 95.

source of widespread difficulties for management and the subject of both scholarly and journalistic observations. Chicago factories reported capacity as 75 per cent of that several years previous²³ because of shorter hours and inefficiency, while still other factories reported capacity as 65 per cent of normal for the same reasons.²⁴ The introduction of the forty-four hour, five-day week, affecting Lynn and Haverhill especially, resulted in a decrease for some factories of 1,200 pairs of shoes per week, at the same time increasing labor-per-unit costs.²⁵

Labor inefficiency, which, although short lived, became so pronounced, is not to be confused with plant overcapacity and normal operation, which, in terms of rated capacity, was about 62.4 per cent in 1914 and 63 per cent in 1919. The competitive character of the shoe industry is suggested by Secretary of Labor Davis' statement in 1925 that "14.5 per cent of the establishments could produce 95 per cent of the required production if they ran at capacity."²⁶ Not only labor but considerations of space became transcendently important by the year's end. New factories were built; all available floor space was rented; plants were enlarged. In Brockton alone permits ran well over a million dollars.²⁷ This expansion was to continue noticeably through February, or for two months after what is thought to have been the peak of production—December. Nevertheless, the Middle West, particularly Chicago and St. Louis, saw intermittent plant expansion throughout the period and enjoyed an earlier resumption of activity in 1921. Cancellations, however, appearing first in March, effectively halted any building programs in progress.

²³ *Ibid.*, September 25, 1919.

²⁴ *Ibid.*, February 5, 1920, p. 46 (see the results of a questionnaire on worker attitudes, effect of piece rates and high wages on efficiency, and absenteeism, *ibid.*, p. 79).

²⁵ *Ibid.*, October 23, 1919 (wholesale shoe market reports).

²⁶ Thomas L. Norton, *Trade Union Policies in the Massachusetts Shoe Industry, 1919-1929* (New York, 1932), p. 106; also pp. 26-28.

²⁷ *SLR*, December 25, 1919, p. 85. It is to be remembered that machinery does not demand a capital outlay, and no particular specifications are required of buildings which house shoe machinery.

At the end of the first year of peace conditions, the forecasts made by members of the industry hold unusual interest. The National Boot and Shoe Manufacturers' Association met on January 20-21, 1920, in New York. A questionnaire had been presented to the members on December 1 with the request that it be returned by January 1. A tabulation of answers respecting trade outlook is worth recording here:²⁸

First question: In your opinion will prices of the following advance or decline during the next six months?

	Advance	No Change	Decline
Upper leather:			
Calfskin	4	22	42
Kidskin	25	30	12
Side	3	7	55
Labor	54	18	0
Shoes for fall	27	21	22
Men's fine and medium-grade	25%	50%	25%
Women's fine and medium-grade	58%	25%	17%

Second question: To what extent are you covered for spring trade?

	Partially	Fully
Upper	21	57
Sole	28	50

Third question: Sales for spring delivery?

Sold Up	Could Take a Few More Orders
47	30

Respecting prices, the shoe manufacturers were better judges of their purchase than of their sale prices. That about two-thirds of them were fully covered indicates quite well that price increases were anticipated. Sales figures clearly reveal the high rate of pro-

²⁸ *Proceedings*, January, 1920, pp. 130-34.

duction which the industry was enjoying. The tone was a little overoptimistic, but not without some warrant. "That deflation would come so soon, or be so drastic as it was, or honeycombed with so many complications"²⁹ was the belief of none of those present, according to J. G. Holters, speaking before the association a year later. But, even while the 1920 meeting was in session, estimated leather consumption was declining, leather production was lower, and stocks had been increasing since July. Exports, which had absorbed 8.9 per cent of shoe production in 1919, although at a high level and on a rising-price basis, were on the wane.

The diminution of exports, which in September, 1921, were 97 per cent short of the June, 1919, high, directed manufacturers' attention to the chaotic state of the exchanges and prompted their indorsement of long-credit-granting corporations like the War Finance Corporation³⁰ and those formed under the Webb-Pomerene and Edge acts.

The shortage of materials, which had been deplored, must be qualified to refer mainly to the finer grades of upper leathers—calfskin and glazed kid—of which a "scarcity" did exist (as will be shown in the next section of this chapter). It was not until the pinch of restricted coal supplies, beginning noticeably in December, 1919, affected the tanners and the freight embargoes limited the movement of materials that a general scarcity of supplies might be said to have arisen; by that time (April, May, and June) supplies were not so urgently needed.

Production of shoes appears not to have suffered its major downthrust until after May, 1920, judging by the doubtful evidence yielded by employment figures. At the first sign of lessening operations, the unions, long established and strong in the east, were successful in their demands for part time.³¹ But even with this bias, employment figures, as a rule, coincide fairly reliably with major turns in production series.

The retailers, frightened in February and March and suffering

²⁹ *Ibid.*, January, 1921, p. 93.

³⁰ See, e.g., address by Eugene Meyer, Jr., *loc. cit.*

³¹ See Norton, *op. cit.*, pp. 135 ff.

by May and June, simply refrained from placing orders for fall delivery. The all but total disappearance of fall work practically suspended manufacturing operations, as is well shown by the employment data, which understate the decline. This condition would be unfortunate under any circumstances, but the calamitous proportions now being reached by the cancellation evil made the situation hopeless by June and July. Shipments were returned in disheartening volume for excuses ranging from insignificant flaws to delayed delivery. Production was brought virtually to a standstill. New England manufacturers in June pooled their stocks of canceled and returned shoes and sold them to the public at prices even below retailer sales. By July and August, 85 per cent of the plants in Chicago were reported not operating; 75 per cent of the Cincinnati factories were closed.³²

This condition of stalemate lasted until the end of 1920. Retailers, found to have been overstocked by about twice their needs, adopted a hand-to-mouth practice of replenishing exhausted numbers. Gradually, sales conducted at great losses worked surplus stocks off retailers' shelves; and the manufacturers, helpless, could only wait until this was effected.

The return of demand, when it did come, was even more sudden than its demise had been. Dollar wholesale sales reached bottom in January, 1921, and rebounded 30 per cent by the following month. The estimated volume of shoes sold wholesale firmed in January and sprang into a rapid incline thenceforward. Production, striking a recorded low in January, jumped 30 per cent in February and continued an unabated rise, measuring 85 per cent by June. Consumption of leather by June had advanced 750 per cent over its December low. All this is the more remarkable for having taken place on a falling-price scale; both wholesale and retail prices continued downward until May, 1922.

TANNING

Under normal conditions the United States imports from 50 to 60 per cent of the hides and skins tanned within its borders. In addition to the domestic supply, United States tanners absorb

³² *SLR*, August 9, 1920, and November 11, 1920.

from one-third to one-half of the hides entering world-trade. Practically all the goat- and kidskins are imported. While it is true that a change in total demand will not affect the total supply of skins, nevertheless, a local shift may alter somewhat the destination of hides entered in world-trade. The exception to this general statement is found in those remote regions where isolated peoples have no established outlet for the by-product of their slaughter and part with dried skins usually only when high prices drive buyers to search far for supplies.

The tanners' supply of materials is conditioned by the rate of domestic slaughter and by the slaughter, exchange rates, demand, and trade policies of other countries. The domestic cattle population—the bulwark of home supplies—was so depleted by war demands that seven years would be required to “replenish the normal crop of beef steers ready for slaughter.”³³ Argentina's beef population was not so reduced because during the war she had found it difficult to obtain other bottoms when the British refrigerators were greatly restricted. Continental Europe's trade in hides was thoroughly demoralized by the war. Germany, formerly the market place of western and eastern Europe, had held her key position because of adequate domestic and foreign supplies. At the war's end, she had neither,³⁴ for her livestock had been drasti-

³³ Estimate of M. F. Horine, statistician, Union Stock Yards and Transit Company, Chicago, in *SLR*, December 25, 1919, p. 95. Mr. Horine, in attacking the government estimates of an increase of ten million cattle left back on the farm during the period 1915-19, points out that we slaughtered 48 per cent more cattle and 70 per cent more calves, in the 1916-19 period than in 1912-15 and that the nation's stock, especially breeding stock, was then less than in 1916. He indicates that the southwestern and Texas drought followed by severe spring storms, in addition to war demand and the high price of cereals in 1918-19, had depleted cattle herds to very low levels and predicts that fewer cattle will be slaughtered for some time to come. With respect to marketing, his forecast proved correct.

³⁴ James Paul Warburg points out that “although European production of sole leather was stimulated by the War, France and Germany, the greatest pre-war producers of high-grade upper leather, were unable to keep up their normal production. Accordingly the opportunity arose for American tanners not only to sell their upper leather in Europe, but to capture great foreign fields such as South America as well. With Germany eliminated, American patent leather dominates the world's market, and glazed kid also is almost entirely an American product” (*Hides and Skins and the Manufacture of Leather* [Boston, 1921], p. 75).

cally reduced³⁵ and the flow of hides from the East was cut off by Russia, who no longer shipped to the German markets. Belgium was finally obliged to prohibit the slaughter of calves, while India, principal source of our goat- and kidskins, was eventually forced into placing a high duty upon their export (as was Spain). Norway, to conserve materials for her tanners, placed an embargo on hides.

Before proceeding with an account of leather in this cycle, it will be helpful to fix in mind the relative magnitudes of the different classes of materials to which tanners turn in appraising basic trade conditions. The data given in Table 6 are derived from estimates which are themselves often translated from other units of measure—feet or pounds—in order to place all the figures on a comparable unit base. The ratio between domestic slaughter and imports, for instance, should be observed; likewise the ratio of both of these to raw stocks. Production compared with both raw and finished stocks gives some hint of the effect of violent price changes.

At the end of 1918 a large part of the world faced a shortage of hides and a cumulated demand for leather products, especially civilian shoes. In the resumption of trade which followed the armistice, those nations without stocks released an immediate demand for both hides and leather. Up to December, 1919, approximately, most European currencies were better able to command products in the United States than at home. Hence there was a great demand for American leather and shoes. This demand was immediately relayed to the hide market. When hide prices were removed from government control on February 1, 1919, they floundered through March, then shot precipitously upward. Heavy native packer hides at Chicago rose from a March average of 27.6 cents to an August average of 52.0 cents per pound,

³⁵ In 1919, even though Germany had only 12 per cent fewer cattle than in 1913, there was a reduction in the proportion of older cattle and of bulls (30 per cent). Hogs were below 1913 by 60 per cent (*SLR*, December 25, 1919, p. 92). Additional evidence of Germany's plight comes from Mr. C. F. Macquire, London, who asserts that "Germany has no prospects of resuming trade in fine upper leather with the British shoe manufacturers, having nothing to export nor materials for tanning" (*Standard Daily Trade Service*, January 7, 1920).

a jump of almost 90 per cent. The market at the end of July was described as "one advance after another . . . with no signs

TABLE 6
AVERAGE MONTHLY VOLUME OF PRINCIPAL HIDE
AND LEATHER MOVEMENTS

	Domes- tic Slaugh- ter	Im- ports	Stocks of Raw Hides	Shoe- Leather Produc- tion	Stocks of Shoe Leather	Exports of Shoe Leather
<i>Cattle hides:</i>						
1919.....	1,437	909	4,150			
1921.....	1,043	313	6,858			
Per cent change...	-28	-66	+65			
<i>Sole leather, sides, or backs:</i>						
1919.....				1,643	5,208	635
1921.....				1,505	11,170	74
Per cent change...				-8	+115	-88
<i>Upper cattle sides:</i>						
1919.....				1,604	5,208	635
1921.....				1,239	8,482	90
Per cent change...				-23	+65	-77
<i>Calf- and kidskins:</i>						
1919.....	753	709	2,650	975	3,820	379
1921.....	680	541	4,448	1,180	7,125	89
Per cent change...	-10	-24	+66	+26	+86	-76
<i>Goat- and kidskins:</i>						
1919.....	2	6,559	16,390	3,292	9,537	1,820
1921.....	0	3,267	9,990	2,903	21,700	472
Per cent change...		-50	-39	-12	+127	-74
<i>Sheep- and lambskins:</i>						
1919.....	1,463	2,986	7,665	836	10,370	0
1921.....	1,570	1,472	12,660	1,440	9,433	0
Per cent change...	+7	-50	+65	+72	-9	-

as to the extent buyers are willing to go to obtain supplies . . . which are far short of the demand."³⁶ So sharp was the rise that the Federal Trade Commission directed its efforts to discovering

³⁶ *SLR*, July 31, 1919, p. 197.

the causes, reporting in August that the high prices were not justified and that they were controlled by the large packers who had taken excessive profits, thus passing increased costs on to the tanners, shoe manufacturers, and public.³⁷ In the first week of August the *Shoe and Leather Reporter* stated that "the market continues to rise and there seems . . . no limit. Many followers of general conditions in the trade are still predicting higher prices. Supplies of hides remaining unsold are small and in packers' control." On August 14 it reported that "tanners are becoming cautious and are not bidding," adding that "the general unrest throughout all sections of the country was in order here when most of the employees of the Yards walked out and a general strike followed." By the twenty-first of the month the packers were "sitting tight" and were

strongly of the opinion that the sudden quietness and easiness in the market, an unusual performance for this time of the year when hides are of the best, will soon end. They point to the fact that there is no accumulation of hides, that most tanners want hides, and that leather has a good demand both here and abroad.³⁸

By the twenty-eighth of August, however, the "smaller and outside country hide dealers" were reported as "running for cover, causing sharp declines in hide prices" by about 25 per cent under peak points. In spite of this the trade was not at all certain that a permanent decline (which "tanners, shoe manufacturers, shoe wholesalers, and shoe retailers would welcome with open arms") was in progress, if we may accept one editor's attitude as representative: Dealers will have to determine whether the present "easiness or weakness" is a signal for a general and permanent decline or a stopping at a way station on the "upgrade to a new mountain peak of prices."³⁹

That confidence in the resumption of a brisk market was justified by current intratrade conditions is apparent. Imports were

³⁷ Federal Trade Commission, *Report on Leather and Shoe Industries*, August, 1919; see also the leather industry's reaction to this report (*SLR*, August 7, 1919, pp. 38 f.).

³⁸ *SLR*, August 21, p. 99.

³⁹ *Ibid.*, August 28, 1919, p. 42.

increasing. Stocks of raw hides were normal. Leather production was increasing at a rapid rate. Stocks of leather were at an all-time low. Leather exports were breaking all records. Shoe production, if we can trust employment as an indicator, was increasing rapidly. Finally, import prices of hides and export (and domestic) prices of leather and shoes were all progressively increasing.

In assigning immediate causes for the abrupt reversal of prices, the *Shoe and Leather Reporter* stated that the trade "generally conceded that values are lower on account of the agitations and investigations." However valid this reason, certain it is that there were agitations and investigations. The press campaign against the high cost of living was in full swing, and a new investigation of the leather industry by the Federal Trade Commission,⁴⁰ ordered by Congress at the end of July, was just beginning. Considering the tone of the first Federal Trade Commission *Report*, released to the public a few days before the peak of prices and adding authoritative support to the newspaper claims of "profiteering," the packers' desire not to be caught a second time in a blameworthy position may actually have had something to do with their willingness to let prices slide off to more "reasonable levels"—if, as charged, they were able to "let" prices behave as they willed.

But the reason of "public sentiment" does not explain the caution of buyers (i.e., tanners) as the peak was reached. Furthermore, such caution was a sudden reversal of their behavior during the preceding month when, competing with their own agents, they went over the latter's heads to the packers themselves to secure hides at any price.⁴¹ One cannot be sure whether changes in the cost of obtaining the material of which hides are a by-product⁴² is

⁴⁰ *Report of the Federal Trade Commission on Shoe and Leather Costs and Prices*, June 10, 1921, p. 212. We are indebted to this exhaustive statistical study for practically all that is known about the industry, from hide prices to retailer profits, during 1918 and 1919 and the first three or five months of 1920.

⁴¹ *SLR*, December 25, 1919, p. 98.

⁴² The hide is about 11 per cent of the value of the steer.

of sufficient marginal strength to deflect the course of hide prices. Steers, good to choice, at Chicago, brought the highest prices in March, 1919. But if the monthly price series is corrected for seasonal, the top price was paid in January. Thereafter, except for a show of strength from July through November, prices sank irregularly until bottom was reached in June, 1921. But, although prices were started downward, the recovery in August to near-peaks was confusing to hide buyers, for they had no way of knowing that still higher levels might not be reached. The demand for shoes was increasing. Hence there was no surface reason to account for the turn in hide prices.

The explanation may be found, perhaps, in the division of the tanning industry into two virtually independent industries—sole-leather tanning and upper-leather tanning—and the unequal impact with which a shift in demand affected each one. With respect to the former, traders could observe the following developments: Raw stocks of cattle hides had been increasing since May, 1919. Sole-leather production had been falling slightly since January and more rapidly since May. Sole-leather exports were at a maximum in July and gave way rapidly after August. Estimated consumption of leather had been slipping since June. The probable reason for the change in sole-leather conditions, in spite of enlarged output of shoes, is in the vigorous shift on the part of wage-earning groups away from the utility factor and toward the style factor in shoes. Such a shift probably bore sufficient weight to lessen the demand for the leather derived from heavy native hides. But why its effect should have been reflected suddenly and for the first time in August, causing a drastic reversal of the precipitous rise, is not explainable on the basis of the trade information available at that time. The only datum which traders were denied by time was the unusual coincidence of the price turn and the low point both of total shoe leather and of sole-leather stocks. From August onward they rose rapidly, to halt only when shoe production again resumed activity in January, 1921. At the latter date, however, there was no relationship between stock and prices.

The change in consumer taste had other repercussions in the tanning industry. Between June and December, 1919, the peak month, the following changes occurred in leather production:

<i>Sole:</i>	Per Cent
backs, bends, etc.	- 22
<i>Upper:</i>	
cattle and side.	+ 21
calf and kip.	+ 23
sheep and lamb.	+ 25
goat and kid.	+ 58

The drift toward the finer leathers at the expense of the heavier "utility" grades is clear. Resulting price changes for the several grades are also important. In this connection the Bureau of Labor Statistics wholesale price index of hides and skins is significant for what it fails to reveal. Since 80 per cent of the weight is given to cattle hides, the index practically coincides with the relative movements of heavy native hide prices at Chicago. It thus gives no hint of the outstanding development in tanning during this period, which will now be explained.

At the end of the war raw skins of each class of raw hides were not far from normal, if we are safe in judging December, 1918, in the light of annual averages subsequent to 1922. But an unusual development began in the stocks of raw goat- and kidskins. For reasons which appear to be obscure, in December, 1918, imports dropped 85 per cent below those of the previous month. In order to maintain normal production this deficiency had to be made up out of raw stocks, which resulted in their reduction by more than a half, bringing them from an estimated 9.5 millions to a reported 4.5 millions in January. Thereupon began a vast accumulation of goatskins, which did not abate until August, when stocks had been multiplied 427 per cent—a net increase of 14.66 million skins. The tanners, who usually hold about 70 per cent of the total stocks, absorbed this entire increase and acquired about twice their normal needs. It is therefore misleading to assume that the rapid climb of stocks in the first half of 1919 was merely a return to normal from war-depleted standards, because the

total increase of all holdings was 17 per cent less than the tanners' net increase in goat and kid stocks.

The accumulation of these materials for the finer grades of upper leather has still more significance when prices, stocks, and production are compared. Based on January figures, imports of goatskins were, by June, increased 437 per cent, stocks 436 per cent, production only 38 per cent. By December, production had increased only 118 per cent over January. In the meantime the raw-skin prices had increased only 81 per cent, whereas glazed kid (the leather product) had jumped 107 per cent. In explanation of this unusual combination of movements, if the possibility that plant capacity could not keep pace with imports be excluded, the figures indicate that, while a rapid accumulation of skins was going forward, on one hand, a policy of withholding a large proportion of stocks from production was being pursued, on the other. That the effort was successful or profitable is indicated by the 32 per cent increase of the price spread between the raw and the finished products. It seems clear that a speculative run-up of prices enjoyed the assistance of a restrictive policy; and, since the tanners stood to profit as a logical consequence of their action, the blame fixed upon them by the Federal Trade Commission⁴³ is probably justified.

The bulge in the prices for raw goatskins at Boston is not reflected in the Bureau of Labor Statistics price index. That market did not reach its high point until February, 1920, almost certainly after the decline in shoe production had set in and two months after the decline in glazed-kid production. The curious fact is that glazed-kid prices were held at the peak level for five months in apparent sympathy with wholesale shoe prices, whose behavior, between August, 1919, and May, 1920, they almost exactly parallel if given a one-month lead. The tardiness in the decline at Boston of the raw-goatskin market may be attributed to the unusual character of the glazed-kid market—a market in which the United States held a near world-monopoly and which, within the United States, was at least a closely controlled industry, judging by the

⁴³ *Report of the Federal Trade Commission*, June 10, 1921.

number of price variations per month over a period of years. This price maintenance is all the more remarkable, since tanners had begun to reduce goatskin imports in July and stocks in September of 1919.

It would be illuminating if prices for both raw skins and glazed kid could be compared with foreign price movements, but the foreign data are not at hand. Inasmuch as goatskins are purchased competitively, one might be inclined at first to look to customs declarations for some indication of world-values. The import price index of raw hides, of which goatskins make up a considerable part, turned down at the end of July, 1920. Goatskins themselves turned down in August. But this is clearly not a trustworthy basis for judging world-prices, because there is no reference to the date at which the price applied or to the manner in which the value was determined.⁴⁴ It does serve, however, to indicate roughly that the Boston market and the other hide markets in the United States were not much, if any, behind world-price movements.

Once started downward, however, goatskin prices fell more rapidly than other raw hides. The comparatively rising strength of the dollar abroad, which prompted exporters to supply the American market with all it could possibly take, coupled with the progressive decrease of tanner demand, served only to accelerate the swift decline in all hide prices. In apparent sympathy with the increased speed of the drop in shoe production beginning in May, raw hide prices melted away with the same rapidity at which they had risen to attract official attention. In the twenty months of its decline, the Bureau of Labor Statistics price index lost 80 per cent, 70 per cent in the final eleven months.

The price collapse was far more serious for the tanners than for the shoe manufacturers. Whereas shoes have a production period of four weeks on the average, sole-leather production requires from fourteen to seventeen weeks. Hence the working capital tied

⁴⁴ The stated valuation at that time presumed to give the true value in the market of origin; but see U.S. Congress, Senate, *American Valuation: Hearings before the Committee on Finance on the Proposed Tariff Act of 1921* (H.R. 7456), *passim*.

up in goods in process is enormous.⁴⁵ In addition, shoe factories produce only on order, while tanneries produce to stock. Thus a price decline is certain to impair the safety of tanners' short-term obligations, while it scarcely affects those of a shoe manufacturer. As a matter of fact, there is little evidence to show that shoe producers directly felt a credit stringency throughout the period. But as early as the middle of February, 1920, editorial note was taken of the difficulty that tanners were having with credit requirements.⁴⁶

During April, May, and June the tanner was beset further with troubles. The rail tie-up both restricted his fuel supply, causing delay or stoppage, and held up the delivery of his products,⁴⁷ thus increasing his demand for credit or postponing the repayment of loans. Through the summer and fall the tanner's position became increasingly difficult. His market had virtually disappeared, and he was left with expensive inventories on his hands. Demand for materials had reached such a state by midwinter, 1920-21, that "many hides and thousands of calf skins were either thrown away or found their way into the glue factories, tanners being unable to finance the purchasing and tanning of same."⁴⁸ Large numbers of tanneries either shut down completely or shifted into custom work (i.e., tanning for packers who could find no market for hides)

The turning-point in the misfortunes of the tanning industry came, not with better prices, but with a better inventory condi-

⁴⁵ See Allen Rogers, "The Leather Industry" in H. T. Warshaw, *Representative Industries in the United States* (New York, 1928), pp. 425-26: "... A sole leather plant having a capacity of 500 hides a day at \$10 a hide has an investment of \$600,000 tied up in hides *in process* to say nothing of the value of finished leather held for sale or shipment, the hides held in storage for daily operations, value of tanning materials, . . ."

⁴⁶ *SLR*, February 12, 1920, p. 100.

⁴⁷ The railway-terminals strike added to the congestion. "Much of incoming finished leather was sidetracked and not delivered" (*ibid.*, December 30, 1920, pp. 62 ff.).

⁴⁸ A. S. Kreider, author of the bill bearing his name requiring the monthly census of leather statistics, in an address before the eighteenth annual convention of the National Boot and Shoe Manufacturers' Association, in New York, January, 1922 (see *Proceedings*, p. 87).

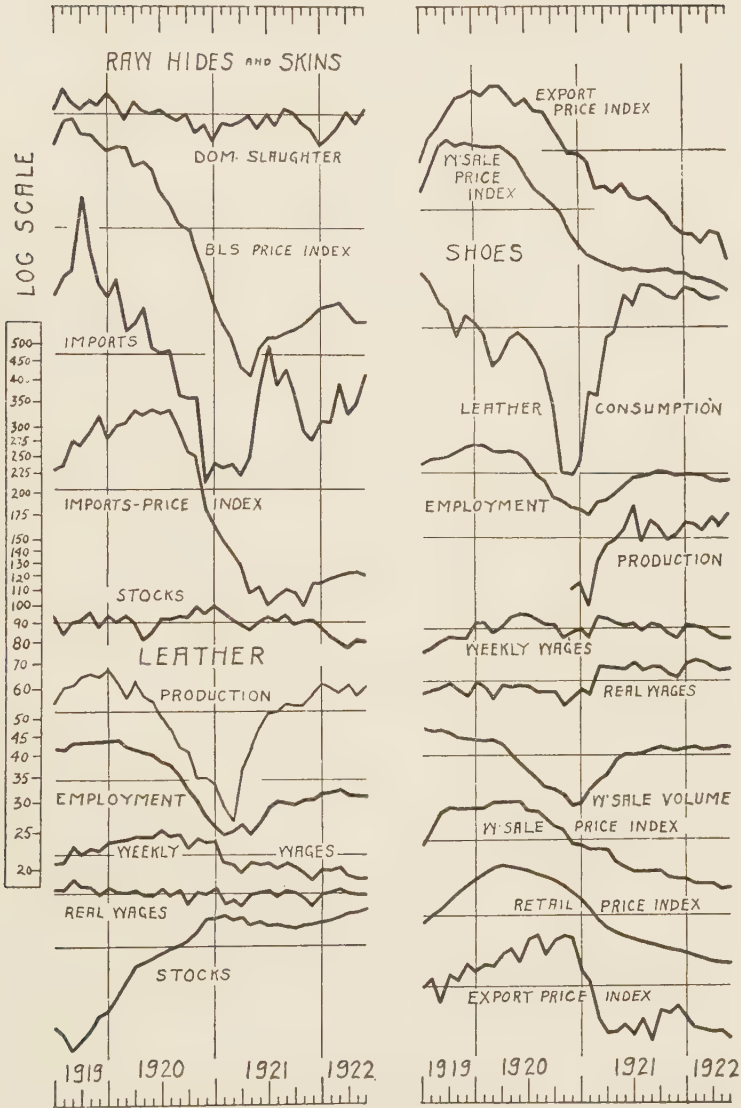
tion. Estimated consumption of shoe leather improved in December, 1920, and the production of shoes increased in February, along with both dollar and estimated physical volume of wholesale sales. This activity was reflected in improved hide- and leather-stock positions. Leather stocks had been mounting since the collapse of hide prices and stood at their highest in January, 1921. Imports of raw hides again turned upward in December. Raw hide stocks turned downward in January. Finally, leather production followed the January improvement in shoe output, and the tide was turned. Hide prices followed tanning operations two months later.

THE LEATHER AND SHOE INDUSTRIES

- Animals slaughtered under federal inspection. National Bureau of Economic Research, index based on Bureau of Animal Husbandry data. Adjusted for seasonal.
- Raw hides and skins. U.S. Bureau of Labor Statistics, index of wholesale prices.
- Imports of hides and skins, pounds. Not adjusted for seasonal. U.S. Bureau of Foreign and Domestic Commerce.
- Price index of imported hides and skins. Not adjusted for seasonal. U.S. Bureau of Foreign and Domestic Commerce.
- Stocks of raw hides and skins. Not adjusted for seasonal. U.S. Bureau of Markets.
- Sole-leather production, number of hides. Adjusted for seasonal. Tanners' Council of America.
- Tanning, factory employment. Adjusted for seasonal. Federal Reserve Board.
- Shoe-leather stocks, total. Not adjusted for seasonal. U.S. Bureau of the Census.
- Price index of shoe-leather exports. Not adjusted for seasonal. U.S. Bureau of Foreign and Domestic Commerce.
- Leather. U.S. Bureau of Labor Statistics, index of wholesale prices.
- Shoe-leather consumption; estimated from leather stocks and production. Not adjusted for seasonal. Three months' moving average, centered.
- Shoe-production, factory employment. Adjusted for seasonal. Federal Reserve Board.
- Shoe production, number. Adjusted for seasonal. U.S. Bureau of the Census.
- Shoes, wholesale distribution. Federal Reserve index of wholesale sales deflated by U.S. Bureau of Labor Statistics, index of shoe prices. Adjusted for seasonal. Five-month moving average, centered.
- Shoes. U.S. Bureau of Labor Statistics, index of wholesale prices.
- Shoes, men's and women's retail-price index. Not adjusted for seasonal. National Industrial Conference Board.
- Shoes, export-price index. Not adjusted for seasonal. U.S. Bureau of Foreign and Domestic Commerce.

CHART IV

THE LEATHER AND SHOE INDUSTRIES



CHAPTER IV

TEXTILES

COTTON

THE COTTON TRADE

THE tremendous war demand for basic materials lifted cotton to about 182 per cent above its 1913 price level shortly before the armistice. Dealers and millowners, who commonly shared the attitude of most businessmen, expected that the war's termination would bring both a price readjustment and curtailed mill schedules. Their fears were quickly confirmed. But by March, 1919, an unlooked-for strength in demand arose. In June and July every branch of the cotton trade was expanding on a rising network of prices.

The extent to which the cotton trade looks to the supply side for price-affecting factors is well known. Against the resurgence of demand in the spring of 1919 was placed the prospect of an abnormally poor crop. Planting had been long delayed by unseasonable weather. Rain and flood conditions threatened the plant quality. The crop-condition report, on June 25, of the Department of Agriculture was 70.0 per cent, as compared with a ten-year average of 81.9, and the total-crop forecast was put at 10,986,000 bales, the smallest in this century. The carry-over on July 31, 1919—the end of the 1918-19 cotton year—would approximate 5,155,000 bales. This was fairly large, but its quality was Barely Middling. These factors had steadily borne cotton prices upward since February 7. During July, however, weather conditions improved, and the crop responded well both as to condition and as to quantity. When this improvement was observed, prices gave way; and the August 25 forecast of 11,230,000 bales further depressed the market. In September the weather turned unfavorable again, and the market revived. Heavy rains in October spoiled much of the cotton, and early frosts in November did serious damage. The result was a short crop, totaling 11,325,-

ooo bales of Strict Low Middling quality. From mid-September onward the price increased with each succeeding report of crop conditions, until at the beginning of November it leveled off at close to 39 cents, where it stayed, with small deviations, until it began its last ascent at the end of February, 1920. While these price influences were at work on the supply side, unusual developments were taking place on the demand side, and we shall now examine some of them.

The standard trading grade of cotton is Middling Upland, an arbitrary term employed to describe the most typical length and quality of American fiber. Several grades above and below this are tenderable in the futures contract at a discount or premium of so many market points "off" of or "on" to the spot price for Middling. These differences are arrived at through certain formal procedures and published periodically, and under ordinary circumstances they vary so little from time to time as to become conventional. This being true, reviews of the cotton trade are generally confined to Middling prices. But in the present period the behavior of Middling does not disclose the real dislocations of the cotton market.

As has been noted elsewhere, the last half of 1919 and at least the first quarter of 1920 saw a remarkable shift of consumer demand in the direction of quality and luxury goods at the expense of the medium and low. This shift was especially pronounced in textile goods, and its repercussions were magnified throughout the entire range of the industry. For this new demand the cotton trade had inadequate supplies. To the July 31, 1919, carry-over of 5,155,000 bales of Barely Middling cotton there was, to all appearances during the growing season of 1919, to be added a disastrously short crop of poor quality. As a result, buyers concentrated their efforts upon filling their mill needs from the diminishing stock of cotton of Middling grade or better, and the differences between trading grades widened rapidly as the price of Middling increased. The size of the differences and the distortions in their relationship can be observed in Table 7.

The element in these changing differences which proved the most dangerous for mill operators lay in the reduction of the pro-

tection usually afforded by hedging transactions. Perhaps it is more accurate to say that a new element of risk was introduced, which often more than offset that escaped in the hedge, the universal use of which in the cotton-manufacturing trade is too well known to require comment. The effect of changing differences can be traced readily. Although the trading grade of cotton is Middling, mills may use whatever grade meets the standards of the trade which they supply. Their hedges are good only as long

TABLE 7*
COTTON PRICES AT NEW ORLEANS
(Cents per Pound)

DATE	MID- DLING	DIFFERENCES			PRICES		
		Good Ordinary (Off)	Low Mid- dling (Off)	Good Mid- dling (On)	Good Ordinary	Low Mid- dling	Good Mid- dling
Jan. 2, 1919.....	17.13	1.50	0.50	0.37	15.63	16.63	17.50
June 2, 1919.....	32.50	9.50	4.75	1.00	23.00	27.75	33.50
Jan. 2, 1920.....	40.00	11.25	6.75	2.00	28.75	33.25	42.00
May 1, 1920.....	41.00	15.25	9.00	3.50	25.75	32.00	44.50
July 1, 1920.....	39.50	16.25	9.50	4.00	23.25	30.00	43.50
Sept. 1, 1920.....	29.25	18.50	10.75	3.25	10.75	18.50	32.50
Mar. 1, 1921.....	11.25	6.00	3.50	2.00	5.25	7.75	13.25

* From data given in the report of the Federal Trade Commission, *The Cotton Trade*, Part I (1924), pp. 272-73.

as the difference between Middling and the grade they use remains the same. Under the conditions obtaining for the year ending September, 1920, mills might have got their sub-Middling cotton free or paid excessive prices for it by following their customary market operations. Every firm, however, was exposed to risks which it would not otherwise take willingly. Profits in some cases were as enormous as losses in others, but the risk placed the conventionally well-protected mill operations on a speculative basis.

Because of variations in differences between January and September, 1920, spinners and weavers who covered bona fide sales with the purchase of forward contracts won gratuitous profits upon yarn or goods made out of sub-Middling cotton and lost

heavily on grades above Middling. In a given instance a mill got its low-grade cotton free and 3 cents per pound in addition.¹ But forward sales against low-grade cotton purchased for storage but for which no yarn orders had yet been obtained were practically useless, since the losses were only slightly smaller than if no hedge had been employed. In summary, hedges against bona fide orders of material constructed from low-grade cotton produced huge profits, while those for fine materials resulted in losses. Cotton hedged against no orders was only slightly better than if no hedge had been made. If these hazards were troublesome for the yarn and cloth mills, they were doubly burdensome for the finishers and cutting-up trades, who for the most part produce for the market rather than on order. They normally suffer an unshiftable risk even when both prices and differences are stable. The first eight months of 1920 put an additional risk upon them which could not be escaped.

There is no way of measuring just what force these trading differences in cotton exerted upon the course of the textile business. One consequence was the realization that the textile business was becoming more speculative. This knowledge, coupled with the huge amounts of credit required to carry inventories at the plant and on stalled traffic lines, must have produced a certain amount of apprehension that the banking demands for the elimination of speculative uses of credit were addressed to them. Even as early as the beginning of November, 1919, a market reaction was in part attributed to the "fear of tight money and Federal Reserve rediscount rates which might cause bankers to call in loans on goods held for speculation."² In November the president of the American Cotton Association explained the association's plan to purchase two million bales of cotton at plantations and to hold it until June, July, and August of the following year to prevent its falling into speculator's hands. Adroitly, the editor of the *Textile World* called this plan itself a speculation and reminded the associ-

¹ Arthur R. Marsh, speech before the National Wholesale Dry Goods Association, 1921, quoted in *American Wool and Cotton Reporter*, February 3, 1921, pp. 49 ff.

² *Textile World*, October 25 (issued November 22), 1919, p. 307 (hereafter cited as *TW*).

ation that "Governor Harding of the Federal Reserve Board has made it plain that he will not allow the resources of the Federal Reserve Banks to be used directly or indirectly for speculative purposes or for facilitating the hoarding of commodities for such purposes."³ Since these events coincided with the stock-market peak, the fears of tight money may have originated from that source just as well as from the published objectives of the Federal Reserve.

Another market condition arose to reduce the efficiency of hedges. The discounts for the trading months farthest away over those nearest turned to premiums in June and July, 1919. By November, however, the discounts had reappeared and rose through March, 1920. In April and May they receded to February levels, but in July they rose sharply to 1,250 points from the 800 established in May. The *Commercial and Financial Chronicle*, in the latter part of July, 1920, indicated its belief that a certain amount of market strength would arise from a much smaller volume of short sales compared with the preceding two years, "owing to the unfortunate experience of hedgers . . . [who] hedged high priced cotton by sales at big discounts only to find the discounts turned to big premiums as the hedged months neared maturity."⁴ Whatever the damage inflicted upon the cotton trade by the emergence of trading differences and alternating discounts, their importance for the cycle analyst does not stop there. An examination of the price trends of the several trading grades becomes profitable.

It will be recalled that by January, 1920, the available supplies of American cotton were contained in two crops—the new and the carry-over—both of which had been appraised at grades below Middling. In consequence of this scarcity, Middling itself might be considered as commanding a premium. This manner of speaking finds justification in the relatively small "on" differences as compared with the great "off" differences. In other words, Middling was from the grades below. This development is important

³ *TW*, November 1-8, 1919, p. 104.

⁴ *Commercial and Financial Chronicle*, July 24, 1920, p. 403 (hereafter cited as *Chronicle*).

to observe because, when the differences are translated into market prices for the individual grades, it is seen that, whereas Middling and those above showed rising price trends after January, 1920, the lower grades actually declined from that date onward. This situation assumes significance when, at a later date under conditions of an apparent cotton "famine," sub-Middling grades became "a positive drug on the market."

We shall examine next an experience in the world's cotton markets which introduces fundamentally conflicting evidence as to the course of demand conditions. The spot price of Middling reached a peak of 43.25 cents in New York on April 16, 1920. The New Orleans market closed at a peak of 41.75 cents on four successive market days ending April 20. The New York market subsequently experienced a short, sharp run-up in the latter part of July, when on the twenty-third a top of 43.75 cents was reached. But, as will be shown later, this rise is believed to be the result of a technical position of the market more than a reflection of mill demand. But the Liverpool exchange, which sets the price of half of America's cotton and reflects market conditions on the Continent as well as those of England, reached its final peak around February 20 and declined steadily thereafter. The mechanics of the Liverpool-New York price differential between February 20 and the middle of April are explainable; but the fact of a declining cotton price in the English textile trade, which seemed to show no tendency toward contraction until May, is not an easy piece to fit into a logical picture-puzzle.

Up to February 4, 1920, when the pound had sunk to its lowest level against the dollar, Liverpool dealers were out of pocket by an increasing amount in order to meet the dollar-buying competition for American raw cotton. Thereafter, up to the middle of April they could offer a progressively higher dollar bid for cotton at no added money expense to themselves owing to the appreciation of the pound. During this period the actual Liverpool price in pence was higher than the estimated parity price in Liverpool based on the New York spot price and the exchange rate. Between April 16 and 20, this differential had diminished to zero. The prices remained at parity until May 15, after which time the

New York price was higher than the estimated parity. The question of which market first experienced a slackening in demand has no clear-cut answer. That which best seems to account for all the facts holds that both markets were independently strong up to the fourth week in April. Thereafter, the American market was not strong enough to hold its gains and the Liverpool market was not able to go to sufficiently higher levels to overcome a new and short-lived exchange weakness which had developed.

We turn now to the conditions surrounding cotton's last stand at high prices, when the New York market, on July 22 and 23, reached 43.75 cents. On the supply side an extraordinarily high rate of consumption at home and abroad had reduced the visible stocks of "spinnable" cotton to low levels. Of more direct importance, however, was the character of the planting and growing season which has been briefly described as follows:

The planting season was very late and unpropitious, due to low temperatures and heavy rains, and the crop got a poor start. During May, torrential downpours produced flood conditions in the states bordering the Mississippi. The heavy precipitation resulted in slow germination of the young plants and caused grass and weeds to spring up so quickly that the farmers, handicapped by the shortage of labor, were unable to cope with them, and much re-planting was necessary. . . . The prospect was for another short crop, the sixth in succession.⁵

Thus by the middle of May the cotton trade faced a heavy demand, a poor carry-over, and a disastrous crop. Then the weather turned favorable, and by the middle of July conditions had almost reversed themselves. Demand had begun to wane, and private estimates of a much larger crop than was anticipated were confirmed when the government's forecast of July 25 added over a million bales. During the week ending July 16, July contracts had risen by 310 points and had also gone to a 770-point premium over October. The *Chronicle* in commenting upon these movements attributed them to the heavy covering of shorts and hedges, adding that Liverpool and Japanese, as well as domestic trade interests, had been active buyers of July options. The *Chronicle* further explained:

⁵ *National Association of Cotton Manufacturers Yearbook, 1921.*

There has been an increasing scarcity this season of the particular grades required to fill contracts under the United States Cotton Futures Act, and month after month has practically cornered itself. The 200-point limit on fluctuations in July has been removed until the option expires at noon on Friday, July 23. The July flurry means the culmination of this supply stringency for the season.⁶

It seems very probable that the strength of the market in July grew largely out of its technical position rather than its own appraisal of cotton values. The heavy discount on forward months, reaching as much as 875 on August, 1,115 on October, and 1,505 on June deliveries, would support this view.

When the price recession started this time, it continued practically without interruption to its low points in March and June, 1921. The improvement of the crop between July and December, 1920, increased the speed of the fall; and when the harvest was finally ginned it turned out to be over 13 million bales, the largest since 1914. Consumption, too, dropped precipitously in the last half of 1920. Mill demand, left to itself, might not have vanished so immediately had it not been terrified by the action of the market. "As soon as the cotton world began to realize the true situation [the collapse of their raw-material price], . . . the drygoods trade practically stopped buying cotton goods."⁷ The conjunction of these forces produced inevitable results.

But the curious preoccupation of the cotton trade with crop conditions and the substantial indifference to variations in consumption rates appeared again in 1921. In December, 1920, and January, 1921, the entire cotton-manufacturing trade began a phenomenal recovery, which was more rapid than the decline and which carried it by June into predepression levels. Nevertheless, the cotton market continued its downward course to a price of 10.38 cents in June. There was a record carry-over of 6,534,000 bales, and the spring was favorable to plant growth. But, by August, plant deterioration and boll-weevil damage threatened the yield,⁸ and prices looked upward. The average price for July

⁶ July 17, 1920, p. 304.

⁷ Federal Trade Commission, *Preliminary Report on the Cotton Trade* (1923), p. 19.

⁸ U.S. Department of Commerce, Bureau of the Census, *Cotton Production and Distribution, 1921-22* (Bull. 150 [1923]), p. 17.

on the New Orleans exchange was 11.49 cents; for August it was 12.78; and on September 10 it was 20.25 cents. "Undoubtedly one of the causes of the sharp price increase in September was the forecast of the cotton crop issued . . . on September 1, 1921,"⁹ when more than a million bales were taken off the July 25 estimate. But the forecast issued on October 3 was not so bearish as the trade had expected, and prices receded, the market having already discounted between July and October the shortest crop since 1895.

COTTON YARN

Wedged between the cotton market and the manufacturers of cotton goods stands the yarn industry. It is not large when compared with cotton manufacturers, because the latter produce most of the yarn which they consume. But there is a pervasive, well-defined market for yarn, and the firms which limit their activity to spinning occupy a position very much like that of the merchant pig-iron producers. The Bureau of the Census does not accord this industry an independent status, and there are no month-to-month records of its physical activity. Nevertheless, because of its marginal position in the cotton industry, it is very sensitive to business changes and therefore merits close observation.

Yarn prices reached a wartime peak at mid-year, 1918. After receding slowly to November and more rapidly thereafter, they found their 1919 low point in March. The brightening markets of that year carried them upward with almost no interruption to their post-war inflated peaks of the first half of 1920.

The unusual character of consumer demand had, by July, 1919, created a "scarcity" of goods and of yarn that taxed loom and spindle capacity. As early as June and July complaints of insufficient supplies began to fill the editorial and market-news pages of the textile journals. Mill agents reported that "the greatest obstacle is to get yarns to sell"¹⁰ and that the bulk of the business was being done on counts from 26's up. The trade had already begun to feel the pressure for the finer counts, which could best be spun from the top-ranking grades of cotton. Forward deliver-

⁹ Federal Trade Commission, *op. cit.*, p. 20.

¹⁰ *TW*, July 5, 1919, p. 147.

ies were reaching higher prices than near-by or immediate shipments. In August the problem of mill capacity rose to plague the spinners. Offers were at hand for almost any length of forward delivery, but the mills were loath to accept contracts which they were not sure they could fulfil. For, in addition to mill supplies, labor troubles seriously curtailed output. A survey in July, 1919, summarized the situation as follows:

A few eastern mills are doing better than 75-85% of theoretical production, while there are large numbers of southern mills that are not doing better than 65%. Most of these mills are sold ahead on the basis of an expected production 10 or 15% larger, which means that the shortage of yarn is increasing.¹¹

It is apparent that the refusal of orders only served to enliven buyers' search for yarn. A short reaction in cotton, caused by the addition of over 1 million bales in the Bureau's crop forecast for August 25, 1919, carried yarn prices with it and induced talk of the probability of downward prices throughout the cotton-manufacturing industry. The carded yarns, having failed since spring to share the intense demand for the combed, sold off appreciably. At the same time there "appeared to be no cessation to the advances in combed yarns," the fine counts being "almost out of sight."¹² Throughout September and early October this tendency continued, the combed and higher counts receiving market attention at firm to advancing prices at the expense of coarse counts. The new crop of cotton, while larger than anticipated, was found to be generally inferior in quality. The natural consequence was an increased pressure for the grades above Middling. In effect, because of the peculiar character of consumer demand, a grave "shortage" of mill supplies was clearly in prospect, and during the balance of October and November yarn prices mounted.

Another element, which will be discussed under a separate heading, was beginning seriously to interfere with the acquisition of spinnable cotton by the conventional cotton-goods trade, and that was the tire industry. Its insatiable demand for staple fibers seriously curtailed the supplies of that grade for the goods indus-

¹¹ *Ibid.*, August 8, 1919, p. 151.

¹² *Ibid.*, August 23, 1919, p. 81.

tries. Spinners, attracted by the tiremakers' indifference to prices, shifted plant equipment to meet the demand from that quarter, and yarn shortages were further increased for other users.¹³

By January and February, 1920, a slacking-off in the volume of goods moving through the market on immediate shipment orders became newsworthy, the more so because it was taking place on a rapidly rising level of prices. The explanation is probably found in the extent to which spinners' output was covered with forward orders. Most spinners, it appears, were sold through July;¹⁴ and the weavers, having covered their yarn requirements as new business was offered them, were not in the market except for filling-in purposes.¹⁵ Spinners themselves wished to avoid new forward business, and many of them withdrew their price lists. The amount of yarn in second hands (i.e., dealers once removed from those having direct factory ties) was unknown. It was assumed, however, that a considerable amount was so held; and it is obvious that tremendous profits were being made on current sales—profits far larger than those which might be indicated in factory price lists, because the latter were becoming more and more nominal.

As prices moved higher in January and February, 1920, the cleavage between carded and combed yarns widened still more rapidly. The coarse counts were neglected; every weaver wanted only the fine numbers. Some of the causes that contributed to this condition are reasonable. The absenteeism of labor in all trades was high during this period. The normal reservoir of good operatives for spindles and looms was reduced in large measure by this factor, and mills were forced to employ those less trained and less capable. But all the operatives, good and poor, balked at having to work with anything but the best grades of cotton because of the lower incidence of breakage in the long fibers. The management too, on its part, recognizing the necessity of holding its employees in order to maintain production schedules, found in the longer fibers in answer to operatives' demand and a means

¹³ *American Wool and Cotton Reporter*, January 27, 1921, p. 100 (hereafter cited as *WCR*).

¹⁴ *TW*, February 28, 1920, p. 91.

¹⁵ *Ibid.*, February 7, 1920, p. 573.

of offsetting their growing inefficiency. With the margin between the cost of cotton and the price of yarn as great as it was, the additional outlay of 2.0-3.5 cents, in order to get better than Middling cotton, was a prudent investment. If this behavior increased the price of staple cotton, it did, *ipso facto*, widen the trading differences on the cotton markets and so relatively depress sub-Middling grades. This situation helps to explain why, in the midst of an apparent scarcity of cotton, prices for the lower grades actually receded after January, leading finally to the condition where "possibly 1,000,000 bales of cotton in 1919 and 1920, which before would have been used, now couldn't be given away."¹⁶

During February the combed yarns reached their peak prices, which they held steadily until the second and fourth weeks of March. The carded yarns, however, kept on rising to an upper turning-point, which came as late as the middle of May. Between March and the middle of May a number of developments arose to paralyze and finally crush the market.

Transportation labor difficulties and freight tie-ups and embargoes caused great havoc by locking up supplies urgently needed. The strike of the longshoremen in the coastwise trade piled the steamship docks high with unmoved cotton and goods. On May 8 it was reported that only a few boats had sailed since March 13.¹⁷ On land, matters were no better. Railroad congestion was aggravated by the freight handlers' strike. "Cars are backed up for miles and freight is held at intermediate points,"¹⁸ complained the yarn-makers. Observers reported that "the congestion is all along the line from the mill to the selling market but it is particularly oppressive in the local market, for yarns cannot be unloaded from the cars or docks and cannot be reshipped to destination."¹⁹ This obstruction to the flow of goods and raw materials produced double-acting consequences, which tended to bring the market into deadlock. Weavers were "at their wits' end to find anything in the local market," because no goods were in sight. Forward sales were at a standstill by this time, because buyers already had many contracts at prices below the present

¹⁶ Marsh, *op. cit.*

¹⁸ *Ibid.*

¹⁷ TW, May 8, 1920, p. 103.

¹⁹ *Ibid.*, May 15, 1920, p. 77.

market and were awaiting their delivery out of the traffic snarl,²⁰ hence were unwilling to make further commitments, not knowing when the shipments would arrive.²¹ Price hazards, labor troubles, and the uncertain arrival of raw materials caused the spinners, on the other hand, to avoid contracts beyond July. Credit stringency, which ordinarily does not strike the spinners on account of their protected operations, was being felt at this unusual period because of the delayed liquidation of goods in transit. All these forces had the cumulative effect of helping to strangle the market.

On the price side an observation made in a speech to a knitters' convention on the last of April by Mr. Lincoln Cromwell attracted wide attention. After pointing out the advances made by the following numbers over 1915 prices,

No. 30 carded peeler 25¢ lb.—now \$1.15—up 90¢ lb.

No. 30 combed peeler 33½¢ lb.—now \$1.65—up \$1.13½ lb.

80/2 mercerized 86¢ lb.—now \$6.00—up \$5.14 lb.

he stated that "such advantage has been taken of the famine in cotton yarns that prices, especially for the finer counts, are stupidly high and excite resentment."²² This resentment extended far beyond the trade limits to which he was referring, for the concerted rebellion against high clothing costs was growing daily and was becoming articulate through the means of "Overalls" clubs and "Buy Nothing" clubs.

It is difficult to trace with precision the culmination of the expansion movement in the yarn industry. The absence of reliable indicators of the physical volume of production forces us to depend upon trade comment and price quotations. The latter, because they are too often merely published asking-prices, are not always trustworthy or sensitive. Mill consumption of raw cotton, traditional weathervane for cotton manufactures, shows faithfully enough the amount of cotton sent to the spindles; but it does not distinguish between that going to the merchant spinners and that

²⁰ *Ibid.*, April 3, 1920, p. 185.

²¹ *Ibid.*, May 15, 1920, p. 77.

²² *Ibid.*, May 1, 1920, p. 93. Speech to the annual convention of the National Association of Hosiery and Underwear Manufacturers, at Philadelphia, April 30. During the war Mr. Cromwell was in charge of the buying of knit goods for the War Department.

consumed by cotton manufacturers who have their own spinning departments. Finally, changes in consumption do not promptly reflect changes in the flow of new orders. Another series, available in 1920, offers doubtful aid: The records of spindle activity in the 1919-22 period merely report the percentage of the total number of spindles which have been in use at sometime during the month and do not reveal the spindle-hours. Even the latter would have been a poor guide in 1920 because of the fairly rapid alteration which yarn specifications underwent. Having noted these shortcomings in the records, we may turn to an examination of the downturn. Price developments will be considered first.

The Cotton Manufacturers *Yearbook* gives the daily price quotations of sixteen representative counts of cotton yarns,²³ eight carded and eight combed. These prices reflect very clearly the peculiar shift of demand toward the luxury end of the commodity spectroscopy and finally the drift back to the middle. The combed yarns rose more rapidly than the carded from their March, 1919, levels, reached a peak in the last half of February, 1920, and turned downward in the middle of March. The carded yarns, on the other hand, reached their peak and began to recede in May. This price behavior closely parallels that of leather, the demand for which turned to the "style" grades in the last half of 1919 and first few months of 1920 and then reverted to the serviceable grades for the remainder of the prosperity period.

The consensus of those close to the yarn- and cotton-manufactures trades reinforces the evidence given by the behavior of prices for the fact that the turning-point was experienced during May. By the twenty-seventh of that month the market was "dead quiet" with "everyone out of it."²⁴ The turn was heralded not by precipitous declines in prices but by an abrupt disappearance of buyers. The editor of the *Wool and Cotton Reporter* described the situation succinctly: "Then . . . came the sudden change. The demand, beginning with the retailers and cutting-up trades, suddenly ceased and the mills manufacturing cottons re-

²³ See *National Association of Cotton Manufacturers Yearbook*, 1921, compiled by F. B. Macy & Co., New Bedford.

²⁴ *TW*, May 29, 1920, p. 197.

ceived cancellations in avalanches."²⁵ The mill reduction of stocks became pronounced sometime during May "in anticipation of much lower prices."²⁶ The fall of yarn prices was substantial in June and gained momentum in July. "There is no price," declared a reporter in that month, "after the rule that sellers have a price, but the prevailing method is that yarn will go for about what is bid . . . whether it covers replacement costs or not. . . . A quotation is a 'give-away' at best."²⁷ Price indices do not show the real speed with which prices actually sank. There simply was no market in which to set prices. The absence of trading is further shown in the number of price quotations which had become nominal. For instance, 196 of the 335 quotations given for July 7 were so listed.²⁸

The evidence thus far shows a price decline in response to a drying-up of demand, originating about the middle of May with the retailers and cutting-up trades. This is in apparent contradiction to the picture one gets by referring to spindle activity and cotton consumption, which reached its peak in July. Spindle activity re-established in July the same peak it had reached during the first quarter. There are at least two important factors which explain this delayed response to demand. The primary one is the fact that practically all mills were booked to capacity through July, some of the orders having been accepted as far back as a year. On top of this an extensive strike in May held up operations and put over into June and July the production of orders which should have been completed earlier.

The decline in yarn prices, once under way, was precipitous. By December the seven-month drop had cut 74 per cent from the price of yarn, and by June, 1921, a low point had been reached which diminished the price to one-fifth of that obtaining a year previously. The fall was stayed temporarily at the end of 1920 and the first month of 1921 but again resumed its descent to June. The combed and the higher counts of the carded yarns lost most heavily.

²⁵ January 27, 1921, p. 97.

²⁷ *TW*, July 31, 1920, p. 87.

²⁶ *Ibid.*, p. 102.

²⁸ *Ibid.*, July 10, 1920, p. 79.

The temporary halt in the decline is interesting. The remarkable recovery in mill activity began in January, 1921. Yarn, wedged between the cotton markets and cotton manufacturing, hesitated, uncertain whether to follow the lead of cotton or of production. It followed cotton. This produced the curious situation in which, between January and June, 1921, cotton consumption bounded upward by 60 per cent, production of fine cotton goods by 170 per cent, and billings of finished cotton goods by 200 per cent, while the prices of yarn declined by 25 per cent! It was not until cotton recovered in June that yarn prices looked upward. During the entire period under review the movements of yarn price indices simply magnified those of cotton, whereas the prices of individual yarn numbers reflected the alterations in consumers' demand schedules. The violent changes in one such schedule affected a large portion of the upper ranges of yarn prices. This was the demand originating in the automotive industry, especially for tire fabrics, to which we shall now turn.

TIRES

A relatively new consumer of cotton in substantial quantities was the automobile industry. Tires especially commanded an increasing proportion of the naturally limited supply of extra-long staple grades of cotton. Because of the unusual strength required of fabrics used in tire production, 1¼-inch peelers, which are grown in America, bore the main burden of tire demand. By July, 1919, 23's yarns spun from combed peelers were bringing as much as 98-103 cents; and the relative scarcity of staples at home directed the attention of buyers to Egyptian Sakellaridis, the yarn from which could be bought at \$1.05-\$1.10.²⁹ Soon after July the tire trade entered the Egyptian market with insistent vigor, and the traditional users both of peelers and of Sakellaridis at home and abroad began to suffer from the inroads upon their supplies made by the prodigal newcomer. Makers of automobile tires, said an observer in reviewing the situation,

were apparently insatiable in their demands for yarn during the early part of the year [1920] and were willing to pay any price at all in order to get the

²⁹ *Ibid.*, July 5, 1919, p. 51.

mills to accept their contracts. Their reckless bidding for tire yarns forced consumers of other types of yarn to pay prices just as high, proportionately, or else go without the yarn, as the spinners were turning their machinery onto whatever type of work showed the most profit.³⁰

The momentum of the tire industry was such that even in 1919 it was expected that about 700,000 bales of staple cotton would be drawn off the market for tire fabrics and that, if the rate of expansion were continued, demand would approximate 2 million bales by 1925. Some notion of the disturbance to the ordinary sources of supply which were depended upon by established lines of manufacture is revealed in the exports to America of Egyptian Sakellaridis from Alexandria:³¹

To Feb. 5, 1917-18 season.....	13,530 bales
To Feb. 5, 1918-19.....	11,972
To Feb. 5, 1919-20.....	205,512

Not only was a large part of the staple crop shifted to tire uses but plant equipment underwent a similar shift. A survey conducted by the *Textile World* indicated that the automobile trade would take a full half of the output of the new spindles installed during 1920 and 1921.³² The expanding demand for tire ducks and fabrics was further shown in a census of automobile tire plant capacity in 1920. Potential output was placed at 160 million tires per year, although only 32.8 millions were produced, as against an estimated consumption of 38 millions.³³

The "reckless" bidding by the tire people for suitable fibers and yarns progressed unabated through the last half of 1919 and well into 1920. The consequent skyrocketing of prices is well described by Arthur Marsh:

How vertiginous this rise was is illustrated by the fact that in the early months of 1920 cotton suitable for automobile tire fabrics, which in the pre-war years had a market value of from 350 to 500 American market points . . . "on" the going price of future contracts, . . . were selling at from 7,000 to 8,000 American points . . . "on" the price of such contracts—and the contract price itself had advanced some 200 per cent.³⁴

³⁰ *WCR*, January 27, 1921, p. 100.

³¹ *TW*, March 6, 1920, p. 102.

³² *Ibid.*, June 19, 1920, p. 77.

³³ *WCR*, February 3, 1921, pp. 49 ff. Census data given by Arthur R. Marsh in a speech before the National Wholesale Dry Goods Association, January 18, 1921.

³⁴ *National Association of Cotton Manufacturers Yearbook*, 1921, p. 12.

Tire prices themselves were generally reduced in April, 1919, at just about the time that staple cotton was beginning to rise. By March, 1920, tire prices were again at the levels obtaining twelve months earlier. Crude-rubber imports also reached a peak in March.

It is difficult to determine just when the demand for tire yarns gave way. The market appeared to show little weakness before May 1. Responding near the end of April to subscribers' inquiries about the probable movements of textile prices, the *Textile World* advised in part that "excepting on very scarce lines of goods like automobile tire cloths, buyers will operate conservatively hereafter." A market report, published on May 1, declared that the urgency for tire fabrics had not abated;³⁵ but a few days earlier the Sterling Tire Corporation had dropped its prices on standard sizes from \$36.00 to \$26.60—a cut of 26 per cent.³⁶ During May tire companies generally reduced their working forces, but to what extent this was attributable to freight stoppage rather than to market conditions is not determinable. It is certain, however, that transportation difficulties did reduce tire production.³⁷ The ability to carry materials and products by truck often measured the difference between closing down and continuing to operate. In one instance a fleet of one hundred trucks was employed to bring one million pounds of fabric from New England centers to the Akron area. On the market side of the tire picture there are numerous instances of price cuts during the latter half of May. Thus we may assume that, while tire demand fell away during the freight difficulties, the coincidence was fortuitous and the events independent. The demand for tire yarns, responsive to events in the tire market, probably gave way in mid-May.³⁸

In placing the collapse of the tire-cloth boom in May, there arises a contradiction more apparent than real when we observe the events in the Alexandria cotton market, whose fortunes had become intimately linked with the tire industry. That market was seized with panic and caved in during the week ending Feb-

³⁵ *TW*, May 1, 1920, p. 175.

³⁶ *Automotive Industries*, April 29, 1920, p. 1038.

³⁷ *Ibid.*, May 20, 1920, p. 1179.

³⁸ Cf. *TW*, May 15, p. 77.

ruary 20, 1920. Its action is best described by a resident member of the American firm who wrote as follows:

The futures market during the week under review had reacted heavily, and the close today—\$137 for March and \$115 [dollars per cantar of 99+ pounds] for November—shows a drop of \$44.50 and \$25.00 respectively on the prices of a week ago. This heavy fall has been brought about by the falling off in the demand from abroad . . . ; during the past two months futures have been pushed up by the daily rise in spot prices, but the position this week has been reversed and the futures market has controlled prices. All the bullish positions being held by speculators, there was a general rush to liquidate . . . ; this rush developed into a panic.³⁹

TABLE 8

Date		Pence	Equivalent in U.S. Cents
Feb.	6.	82.50	114
Feb.	13.	91.00	130
Feb.	20.	96.00	138
March	5.	85.50	130
April	16.	86.50	142

The magnitude of the price movements is to be seen in the Liverpool spot market for Sakellaridis (Table 8). Preceding February 20, speculative buying, on the prospects of a shortage of tenderable cotton in Alexandria, had pushed prices to the point where export houses had virtually withdrawn from the futures market. It is reported that most of them had already completed their purchases for actual sales abroad.

Any thorough explanation of the precise character of the forces contributing to the panic must encompass a wider range of details than are offered here, but certain main features of the situation suggest a likely hypothesis. Undoubtedly there was a real speculative run-up in futures on the prospects of short supplies and of a continuing vigorous demand from abroad. But up to February 4, at least, American buyers could continue to offer higher prices in Egypt at no extra outlay of dollars because of the progressive depreciation of the pound sterling. Thereafter they were

³⁹ Letter, dated February 27, quoted in *Chronicle*, April 3, 1920, p. 1443.

forced to make definitely larger outlays if they were to obtain cotton. If, as is believed true, their needs were practically covered by earlier contracts, it is apparent that they could afford to resist the market for awhile; and this is probably what they did in the week or two ending February 20. But here is the curious element in the picture. February 20 actually saw the turn in the Liverpool-Alexandria market for Sakellaridis. It never recovered. But the American demand had not slipped. It did, in fact, go on to push its own prices to a maximum which did not arrive until two months later—April 16. How much cotton was actually being delivered at the April prices we have no way of knowing, but the amount was sufficient to make a market. The fact seems clear, however, that the market for Sakellaridis was made in America by the automobile-tire manufacturers, who did not reach their peak requirements until April or May. The Alexandria boom and crisis materialized with the failure of its participants to anticipate the effects of the official British determination to follow the recommendations of the Cunliffe Committee.

The strength at home of the $1\frac{1}{4}$ -inch peelers is evidence, though imperfect, of the continued tire demand. This market did not reach its peak level until May 20, at which it held through June 18. In so far as the peelers were in extremely short supply, it is probable that their price does not represent an active market demand but rather the desperate filling-in of a few yarn manufacturers' orders.

COTTON MANUFACTURES

The total demand for cotton fabrics springs from a myriad of sources. For this reason the market is so diffuse that it cannot be observed directly but must, instead, be inferred from data and from opinions originating on the side of suppliers which, for the most part in this case, are the mills themselves.

Before the hand-to-mouth practice of buying became conventional after the depression, mills generally received, either through their own representatives or through independent agents or factors, forward orders three to nine months in advance of delivery dates. A small portion of orders extended for a year, and there

were, of course, always a substantial number for immediate shipment. In 1919, as early as July, the strength of market demand and the favorable position of the mills could be seen when the mills began "withdrawing their spring (1920) lines, unable to take more orders."⁴⁰ This condition of having the order-books filled to the estimated capacity of the plant as far in advance of delivery as the mills thought safe characterized the experience of cotton manufacturers at least through April, 1920. As a matter of fact, such pressure was placed upon the mills to accept orders that they were forced to resort to the allotment of probable output among their regular, old customers and to send newcomers away empty-handed. Prices did not have much weight in the negotiations; the key question was: "Is it available?"

The tremendous pressure for goods brought forth a rapid expansion in textile plants and equipment. There are no sales-volume figures for textile machinery, but in Massachusetts the employment in this industry increased by a third between April, 1919, and the following March. These figures are interesting in another respect. Employment did not begin to fall off until November, 1920, long after the demand for cotton goods had collapsed. During the phenomenal recovery of cotton manufactures, and for eleven months after the turn in cotton consumption, employment in textile machinery continued to fall. Data for the construction of new mills are available for the first half of 1920 and show 135 new cotton-mill projects and 229 important enlargements of existing plants. "The capacity of machine builders has been taxed to the utmost," said the *Textile World*, "and the installation of new machinery has been made as fast as the freight situation . . . would permit."⁴¹

During 1919, editorial pages expanded in wonderment at the unheard-of demand for luxury goods, the mass extravagance, and the apparently endless buying power of the working classes. In curious contrast to the public behavior, the growing agitation against the "H.C.O.L." produced antiprice organizations; the federal and state governments sponsored drives against rising prices

⁴⁰ *TW*, July 5, 1919, p. 129.

⁴¹ *Ibid.*, July 17, 1920, p. 24.

and profiteering; trade associations promoted "economy sales" and encouraged people to use serviceable things and to wear them out. The feeling was common among managers of established mills that mounting prices would eventually collapse, bringing in their train cancellations and mill-closings. Likewise, everyone, from government officials to editors, felt that the antidote for rising prices was increased production and individual frugality.

In the meantime the production of fine cotton goods mounted continuously from June through January, 1920. Profit margins increased more rapidly than the price of Middling cotton and continued to do so through April, 1920. There was some falling-off of production in November because of the coal shortage, but this was not so serious in fact as was feared. At the end of November the stock market gave way, but the cotton-goods trade, at least, gave it little thought. Some in the trade welcomed it on the grounds that funds released from use in Wall Street were urgently needed by manufacturers to carry the now heavier burden of operations. In February and March textile shares showed rather extended losses; but in discounting this as an important part of the textile picture it was repeatedly shown that nothing but a national calamity could prevent the first half of 1920 from being the most profitable period in the history of earnings. Funds, however, were becoming more difficult to obtain, and this fact gave rise to as much apprehension as anything else on the cotton-goods horizon. The fear grew in February and March that trouble was ahead because of the "impossibility of forcing retailers and consumers to pay the latest advances at first hands—without radically curtailing purchases."⁴² Any change in the consumer's mood between the time the materials are purchased and the time they emerge as goods for sale—"nearly a year"—is always a hazard and at this particular time was a serious one because of the enormous upward swing in prices.⁴³ Mill supplies, goods in process, and inventories constituted an ever present source of great financial loss if, at the end of a rising scale of prices, consumers had decided not to buy at all.

⁴² *Ibid.*, February 28, 1920, p. 22.

⁴³ *Ibid.*, p. 95.

The largest source of real worry, however, at least up to the middle of May, was the physical inability of mills to maintain production schedules, owing to labor inefficiency, strikes, and the congestion on the railroads. Although there are no full records which disclose the average amount by which mills fell short of capacity output, the trouble with labor was real and significant. As early as July, 1919, reports of failures to maintain normal output were frequent. In August a partial survey was made, and the report concluded that

few eastern mills are doing better than 75-85% of theoretical production, while there are large numbers of southern mills that are not doing better than 65%. Most of these mills are sold ahead on the basis of an expected production of 10 or 15% larger which means that the shortage . . . is increasing.⁴⁴

The shortening of hours and pay-rate increases did not provide cures. At New Bedford increases of 15 per cent in June, 12½ per cent in December, and 15 per cent in June, 1920, were made. Fall River reported similar changes for weaving print cloths. American mills, of course, were not alone in these rate increases. At the end of March the operatives in Manchester, England, demanded an increase amounting to 60 per cent. The pressure there was perhaps greater than in American mills because of war losses. It was estimated in March that 10-15 per cent of the looms were idle for want of operatives and that, because of this situation, English output was estimated at only 60-65 per cent of the 1913 rate. The condition in the United States was almost as serious. At the annual convention of the National Association of Cotton Manufacturers in April, 1920, Mr. W. Frank Shove devoted a large portion of his presidential address to labor difficulties, a characteristic passage of which follows:

As we all know, in the cotton trade each successive advance in wages has marked a distinct diminution in the quantity produced. To my mind it is only possible to ascribe this to one reason, which is that the tendency among the majority of our operatives is to work steadily for sufficiently long a period to make possible the accumulation of a certain amount of money over and above actual necessities, and then to take a more or less extended holiday.⁴⁵

⁴⁴ *Ibid.*, August 2, 1919, p. 151.

⁴⁵ Quoted in *TW*, April 24, 1920, pp. 122-23.

The result was, he pointed out, that substitutes were impossible to find or were unfamiliar with the particular task and so production suffered.

In April the loom fixers went on strike in New Bedford and successfully tied up the American center of the production of fine cotton goods. A general strike in sympathy with the loom fixers took place in May, affecting eighteen mills, and continued until a 15 per cent rate increase was granted in June.

Up to this point labor conditions within the mills have been under consideration, but it is entirely possible that the mills were far more damaged, ultimately, by the behavior of labor outside the plants in connection with transportation difficulties. The credit strain of financing vast quantities of goods held up in transit was one of the major factors in the general contraction of the cotton-goods trade. On March 13, 1920, the coastwise long-shoremen struck. Union truckmen refused to haul goods from coastwise piers and employed whatever means they could in preventing nonunion truckmen and company trucks from loading or unloading ships or clearing pier warehouses. This tie-up was so thorough that on April 10 over \$60,000,000 worth of cotton alone remained unmoved at the port of Boston.⁴⁶ Then the railroad situation became vastly more serious. When the Railroad Administration returned the roads to their owners on March 1, there were 133,237 freight cars loaded and unmoved.⁴⁷ Little improvement in the snarled traffic situation was possible before an unauthorized strike by railway boatmen and freight handlers began about the sixth of April.⁴⁸ This "Outlaw Strike" included the yardmen at Chicago and gradually spread from the major traffic centers of the country to intermediate points. Soon all roads into New York were struck, and the companies quickly established preferential schedules for necessities. During April, May, June, and July the freight paralysis and its consequences sorely damaged the cotton-goods trade. Preferential schedules virtually placed an embargo on the movement of cotton into the mills and

⁴⁶ *Ibid.*, April 10, 1920, p. 34.

⁴⁷ *WCR*, February 2, 1921, p. 48. Speech by Bentley P. Neff, president of the Dress Fabrics Buyers Association.

⁴⁸ *Chronicle*, April 17, 1920, p. 1577.

goods out to jobbers and retailers. It is difficult to exaggerate the chaos into which the trade was plunged. The timing of the tie-up could hardly have been more disastrous. The unhappy conjuncture of credit conditions that were already strained in April, retailers long delayed in supplying a trade which was now beginning to weaken, and unmoved trainloads of credit-consuming goods produced a crisis from which the cotton-manufacturing trade did not recover. Let us examine in some detail the antecedent developments which converged in this impasse.

The rate of increase in the volume of new orders, as we have noted, began to dwindle in July, 1919, not for lack of demand but because mills were already sold to as great a capacity as they believed they could physically produce. This condition continued probably through March, 1920, when other reasons against long forward contracts began to appear. In March, however, an analysis showed that there was no supply of goods in the markets except that produced on orders long since placed.⁴⁹ From the middle of April, notes of caution on the part of goods buyers were noticeable. The higher cost of carrying operations through, the somewhat disappointing March retail-trade reports, and the uncertainty about shipments were cited as causes. At about this time the fear of cancellations rose as an effective element in forward contracts.⁵⁰ As the transportation difficulties increased during the latter part of April, retailers and jobbers rather than mills were the ones to turn against the market. They became reluctant to place further orders until they could learn if the goods already in transit would arrive.⁵¹ The end of April found both buyers and sellers against long commitments. July deliveries appeared most frequently as the limit of current new business, especially on staple products. Nevertheless, some degree of continuity of business volume was anticipated, for, although they were finding buyers more cautious, shirting converters were selling for 1921 deliveries.⁵² The *Textile World* published its estimate of the backlog for cotton goods and stated that "something over 50% of

⁴⁹ *TW*, March 6, 1920, p. 157.

⁵¹ *Chronicle*, April 24, 1920, p. 1771.

⁵⁰ *Ibid.*, April 17, 1920, p. 71.

⁵² *Ibid.*, p. 1770.

domestic mills have their production completely sold to July, while 25 to 33% are fully sold to October, and the balance through the remainder of the year."⁵³

The behavior of cloth prices is instructive. Cloth is much closer to the consumer than yarn, both in the production process and in price movements. The *Cotton Manufacturers Yearbook*⁵⁴ gives the daily prices of fifteen gray-cloth constructions. The finer constructions, such as fine lawns, etc., reached peak prices in the latter part of January, 1920, and the first two weeks of February. This was a little earlier than the combed yarns. But the high-numbered gray cloths held at or near peak prices until April and the first week of May before receding. On the other hand, the low-count cloth did not reach its maximum until April and gave way in that month also. In short, the entire range of representative constructions experienced price turns in the latter part of April and first week of May. It should be noted, however, that these quotations are spot. We have no indication of what long-contract prices were doing in the meantime.

A comparison of prices in England with those in the United States shows that from April, 1919, to August, 1920, cotton-cloth prices in Manchester were lower than those in New York, at the current rates.⁵⁵ The difference amounted to as much as 28 per cent at the beginning of February, 1920, but gradually tapered off to zero at the end of July. The difference, however, was large enough during the year ending in June to make the importation of cloth into the United States a profitable undertaking. Evidently, advantage was taken of this situation, for cotton-cloth im-

⁵³ April 24, 1920, p. 93.

⁵⁴ *National Association of Cotton Manufacturers Yearbook*, 1921, pp. 136 ff.

⁵⁵ This comparison is on a basis of eight comparable fabrics in each country. The estimates are those made jointly by the National Association of Cotton Manufacturers and the Bureau of Business Research, Harvard University, and constitute the best treatment of the subject which the present writer has found. The Harvard study was published as Bureau of Business Research, *International Comparisons of Prices of Cotton Cloth* (Bull. 17 [Cambridge, 1920]), p. 24. Unfortunately the indices are brought down only to March 30 in the Bulletin, although selected series are reproduced in the cotton manufacturers' *Yearbook*, 1921, and carried on to the end of 1920.

ports before and during the war averaged around 5 million square yards monthly, but November, 1919, imports suddenly jumped to 10 millions, and January to 16.6 million yards. February, March, and April each showed 15 million; May, June, and July about 14 million; August, 10 million; and then imports subsided to their former levels.⁵⁶ The trend of prices themselves in the two markets is noteworthy. The average price for these particular eight constructions fell in New York after mid-April, fractionally to the end of the month, but rapidly in May. Manchester prices, on the other hand, did not recede until the second week in June, having held to a plateau of about 61*d.*-62*d.* per pound for the preceding three months.

For those countries having extensive trade outlets in China—and England was probably the foremost—enormous profit potentialities arose. In March, 1919, the Shanghai prices on comparable cloth were 80 per cent above the New York prices. English prices were only about 10 per cent above New York and moving rapidly below. The differential in favor of New York exporters continued until April 15, 1920. But the differentials between China, England, and the United States were such that British traders could re-export American cloth to China at a profit up to May, even though the China differential had become unprofitable for American traders a month earlier. Whether or not great quantities of American cloth flowed directly, or via England, to China, because of price differentials, there is no way of knowing. The profit margin between England and China during the last three quarters of 1919 and the first quarter of 1920 was without parallel. The spinning margin of Lancashire mills in the far eastern trade, which is ordinarily 4*d.*-5*d.* on a pound, at one time got to 32*d.* per pound. One mill made a profit of 228 per cent in twelve months.⁵⁷

American cloth enjoyed a foreign demand which began to assert itself in May, 1919, and pushed steadily forward for a year. In the peak month—May, 1920—exports totaled 90 million yards, more than double that of the same month a year earlier

⁵⁶ Supplement to the *Survey of Current Business*, Part I: *Textiles* (1927), p. 34.

⁵⁷ Arthur R. Marsh in the *WCR*, February 3, 1921, p. 49.

and an all-time record for one month.⁵⁸ The disappearance of foreign buyers coincided with the collapse of our own domestic market; and exports diminished, with but one interruption, until our mills resumed operations early in 1921. There seems to be no reason for assuming a casual relationship at the time of the upturn.

Before returning to the events of May, a review of consumer reaction to the increasing prices will be worth while. It is mild to say that those engaged in the goods trade were always apprehensive about how the final consumer would react when the raw and semifinished materials, entering the various steps of production at ever increasing costs, finally reached him in the finished article three to six or nine months later. It is unfortunate that no records are available to show the movement of cotton goods at retail outlets. One of the internal obstacles to the collection of such data is the diffusion of the market. The index of sales by department stores is the only series which approaches our need, but a moment's reflection proves its inadequacy.⁵⁹ The wholesale market is partially revealed in the index of wholesale sales of dry goods, but the entire matter of retail stocks and the futurity of contracts enters to destroy any confidence in the notion of parallelism between this index and retail sales.⁶⁰ The only indication of consumer behavior which can be gathered is the comment offered in the market pages of specialized journals.

The first effect of consumer demand was the notable pressure

⁵⁸ Save in one instance—108 million yards were exported in December, 1917, under wartime control.

⁵⁹ Sale of cotton goods by department stores is probably not large compared with total sales. Even if it is, there is no acceptable index of retail prices with which to deflate the Federal Reserve index which is in dollar volume. For whatever value the information possesses, department-store sales reached their peak in July, 1920.

⁶⁰ The Federal Reserve index of wholesale sales of dry goods has several shortcomings which diminish its usefulness in connection with the cotton-goods trade. First, among the sixteen firms in New York which in 1925 sold about one-quarter of the total sold by all of the dry-goods firms reporting, only seven firms sold cotton goods, while nine were engaged in the silk trade (cf. *FRB*, December, 1927, p. 821). Second, the index for our period does not include reports from the Boston Federal Reserve district, the American center of cotton-textile manufacturing (cf. *ibid.*, April, 1923, p. 439 n.).

upon the relatively limited supply of "class" merchandise and the degree to which such grades were forced out of balance with respect to the prices of "bread-and-butter" lines. "We are passing through a luxury consuming era," was the complaint in August, 1919, "but a revulsion of demand is in sight and the old . . . lines will have their inning eventually." In September it was predicted that the "free discussion given to the high cost of living would be influential" in the making of new prices and "may lead to a contraction of consumption at large." By December the feeling had "gained ground . . . that the point has been reached where the ultimate consumer could not pay asking prices for goods."⁶¹ Also in December the Department of Justice requested the National Retail Dry Goods Association to propose at its meeting on the seventeenth a series of economy sales to inaugurate a new drive on the high cost of living.⁶² At the same time the American Woolen Company in Lawrence undertook to set up a department store to provide employees with goods at cost if the town merchants refused to lower prices immediately. Notwithstanding high prices, the public continued through February to buy heavily, and expert opinion in the trade held that demand was not diminishing. By the second week in March, however, a change was distinctly noticeable. The spring season, as we have seen in another connection, was cold and wet and two or three weeks delayed. Whether for this reason or for others, retail trade was definitely below expectations in March. Trade comment was about equally divided in alleging causes. Parenthetically, the whole dry-goods market suffered a major setback in this month, and it never returned to the preceding high level of sales.

It was in April that the consumer antiprice organizations flowered into maturity as far as the cotton-goods trade was concerned. On April 3 the *Chronicle* observed that "there is no doubt but that the public clamor for lower prices is asserting itself in all quarters of the trade."⁶³ In its issue of the twenty-fourth the cotton section was practically filled with news and editorials of the prog-

⁶¹ *TW*, November 29 (issued December 13), 1920, p. 111.

⁶² *Ibid.*

⁶³ P. 1445.

ress of organized consumer resistance. The following quotations will help to recreate the temper of this short but crucial period:

. . . . The people believe they are being robbed and they are sick of it. . . . They are striking back . . . [some] say they will not buy new clothes until they are literally compelled to. . . . The movement to . . . bring down the high cost of living is gathering momentum. . . . Hundreds of Overalls Clubs are springing up. The program of one club is: Don't Buy Anything. . . . Old Clothes Clubs are supplanting Overalls Clubs. The tendency towards economy is . . . sharp. Jobbers and retailers know that the people are being strained. . . . Some of the big retail department stores are beginning to reduce their prices of wearing apparel.⁶⁴

The rebellion of the ultimate consumer against the exorbitant prices . . . for ready-to-wear garments particularly is making itself manifest in no uncertain way.⁶⁵

The beginning of May witnessed the change that has meant such disaster. . . . The public . . . changed its policy. . . . The era of extravagance was over. "Twenty per cent off" sales swept the country. The public, instead of being influenced to buy on account of these sales, apparently was strengthened in its determination to economize.⁶⁶

Having traced at some length the price developments in cotton cloth, the freight tie-up, and the organized public resistance to high prices, we may now consider the mutual effect of these factors and of credit. Late in February, 1920, the first traces of a tightening money market, as far as cotton textiles were concerned, began to appear. This coincided with a short but definite reaction in cotton, yarn, and cloth. The market prices resumed their upward movement in March, but funds did not again become plentiful. Thereafter mills kept one eye on the money market when undertaking additional operations. The *Chronicle* reported in mid-March that "talk regarding merchandise was still coupled with talk regarding money" and that the goods market appeared to be "waiting for a lead from the financial markets before going ahead."⁶⁷ But up to mid-April there had been no mention of anything in connection with which money was tight except, in a general way, "speculation." Then merchandise and raw materials became stalled in transit; it was discovered that there

⁶⁴ *Ibid.*, April 24, 1920, pp. 1763, 1765.

⁶⁶ *WCR*, January 6, 1921, p. 47.

⁶⁵ *TW*, April 24, 1920, p. 88.

⁶⁷ *Chronicle*, March 13, 1920, p. 1106.

was a crisis of serious dimensions in Japan; fear arose of the consequences of dumping speculatively held cotton, cotton yarns, and cloth; the stock market again gave way after recovering from its February setback; cancellations were already large in other industries. These real objects emerged as financial hazards and could be observed by the trade as endangering the security of funds employed in textiles. The fear of increasing credit restrictions as they might affect speculation and as a result the market was expressed by one writer as follows:

One of the bugaboos of the textile selling trade has been the entrance of speculators who have had no extensive experience. . . . Consequently there is a marked fear of goods being dumped upon the market by this class of trade to an extent that would prove demoralizing.⁶⁸

Credit was not a seriously compelling factor until the "Outlaw Strike"⁶⁹ literally stopped the flow of goods along the eastern seaboard. Goods could not be charged until delivered, and loans on ordinarily self-liquidating transactions could not be met at the banks when due. The banks, feeling the eventual safety of many of these loans in jeopardy and already at the limit of their lending power (perhaps in some instances merely at the psychological limits fathered by the Reserve Board), pressed for payment. Credit lines were reduced throughout the trade. The situation became extremely acute for the medium-sized firms, for they were, relatively, the heaviest borrowers.⁷⁰ While these matters were growing worse as April deepened, the buyers' strike was simultaneously reaching its climax. By the first of May most retailers and jobbers realized that they no longer needed the orders which they had desperately awaited in April, and nondelivery offered the handiest excuse for cancellation. The American Woolen Company alone received cancellations totaling \$40,000,000.⁷¹ If credit conditions for the cotton-goods trade were strained by slow collec-

⁶⁸ *TW*, May 8, 1920, p. 98. The first editorials on this subject, less strongly worded, began to appear early in April.

⁶⁹ A particularly good account of the immediate effect of this strike upon New York is to be found in the *Chronicle*, April 17, 1920, p. 1652.

⁷⁰ *TW*, April 4, 1920, p. 34; also April 17, pp. 32, 77.

⁷¹ *Ibid.*, September 11, 1920, p. 22.

tions, they became doubly so when the wave of cancellations set in, entailing real financial losses.

The convergence of these mutually depressing elements created a force which the textile trade could not withstand, and before the end of May contraction was on in earnest. The liquidation ran unabated until November. Cancellations were high even at that date, and buyers for the trade were still out of the market. "The whole textile trade seems excessively demoralized," wrote one reporter. The election of a Republican administration and Congress was heartening, but no tangible effects could be discerned. The most prominent subject in the December gloom was that of retailer stocks. The manufacturers, converters, and the cutting-up trade were impatient at the dry-goods merchants' and clothiers' failure to liquidate their stocks and editorially deplored their "gentlemen's agreements" not to hold bargain or clearance sales before Christmas. Stocks of retail dry goods were estimated at 20 per cent above normal.⁷² In January, 1921, however, with no discoverable cause (other than that of a still unsatisfied consumer demand which was now attracted by prices at a fraction of what they had been six months earlier), the merchandise inquiry broadened. Favorable reports of business by wholesale and retail clothiers came in with the beginning of the year,⁷³ especially from the West, where retail liquidation had gone forward rapidly.

With a suddenness that surprised the trade, wholesale markets became active and manufacturing rates shot upward at a phenomenal speed, reaching the three-year average by June, 1921. The only explanation which can be offered is that the retailers, attempting to adjust their stocks to a low level of consumption, had deserted the wholesale markets. The mills, meanwhile, having to dispose of redundant goods, regulated their production schedules accordingly. When the unexpected resurgence of consumer demand caused retailers to lift their buying rates sharply and to revise their estimates of appropriate stock levels, the mills found themselves obliged to move quickly back to normal production rates.

⁷² *Ibid.*, December 4, 1920, p. 102.

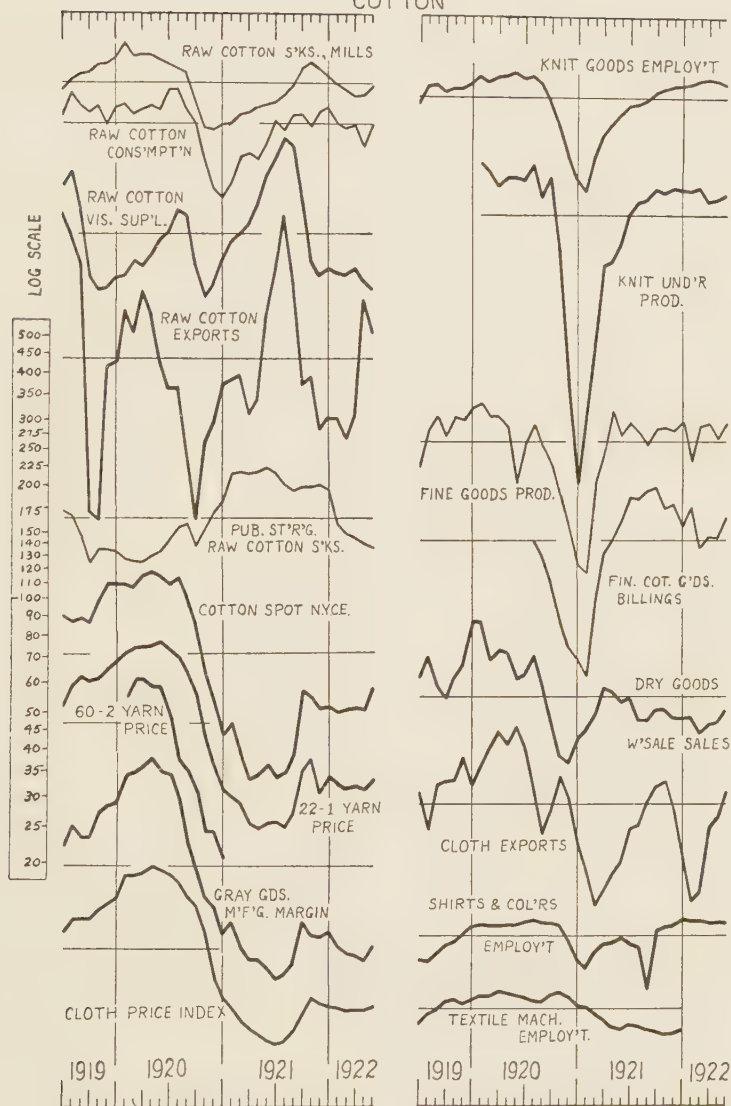
⁷³ *Ibid.*, January 15, 1921, pp. 19, 20.

COTTON

- Raw-cotton stocks at mills, end of month. Adjusted for seasonal. U.S. Bureau of the Census.
- Raw-cotton consumption by mills. Adjusted for seasonal. U.S. Bureau of the Census.
- Raw cotton, visible supply. Adjusted for seasonal. New York Cotton Exchange.
- Raw cotton, including linters, exports. Adjusted for seasonal. U.S. Bureau of Foreign and Domestic Commerce.
- Raw-cotton stocks in public storage and in compresses. Adjusted for seasonal. U.S. Bureau of the Census.
- Knit goods, factory employment. Adjusted for seasonal. Federal Reserve Board.
- Knit-underwear production. Adjusted for seasonal. U.S. Bureau of the Census.
- Fine cotton goods, New Bedford production. Adjusted for seasonal. Fine Cotton Goods Exchange.
- Raw cotton, middling upland, average of daily spot prices, New York. New York Cotton Exchange.
- Finished cotton goods, billings. Adjusted for seasonal. National Association of Finishers of Cotton Fabrics.
- Cotton yarn, white, mule-spun, northern, 22-1 cones, price. U.S. Bureau of Labor Statistics, index of wholesale prices.
- Dry goods, wholesale sales. Adjusted for seasonal. Federal Reserve Board index.
- Cotton yarn, combed, 2-ply warps, 60s. price.
- Cotton cloth, exports. Not adjusted for seasonal. U.S. Bureau of Foreign and Domestic Commerce.
- Gray goods, manufacturers' margin. Stephen J. Kennedy, *Profits and Losses in Textiles* (New York, 1936), p. 246.
- Shirts and collars, factory employment. Adjusted for seasonal. Federal Reserve Board.
- Cotton cloth, five types of gray goods. *Textile World*, wholesale-price index.
- Textile machinery and parts, factory employment, Massachusetts. Not adjusted for seasonal. Massachusetts Department of Labor and U.S. Bureau of the Census.

CHART V

COTTON



WOOL

Raw wool and wool manufactures experienced the same consequences of shifting consumer demand that overtook cotton, and that experience need not be reviewed here. There are some significant economic differences between these two fibers, however, which make it desirable to survey each separately.

The price of wool was controlled during our participation in the war. Quarter- and $\frac{3}{8}$ -blood domestic scoured grades were held at 300 per cent of their 1913 price levels for the last half of 1918. At the war's termination the government took over wool stocks amounting to about $\frac{3}{5}$ of the total in the United States and gradually disposed of them over the four years following. Raw wool, unlike cotton, which is treated in standardized spot and future contracts, has no such grading standards and is sold only at auction, where title to specific lots changes hands.⁷⁴ The announcement of the first auction of wool by the government for December 18, 1918, and fortnightly thereafter, commanded the interest of the entire market. At the December sale the bid prices were below the upset prices, and about 75 per cent of the wool offered had to be withdrawn. The trade was discouraged, and in January the government announced that it would stop its sales between July and November to let the domestic clip for that year go undisturbed. The upset prices for the January sales were lowered to meet those of the British government, which held about four times as much wool, and the withdrawals, amounting to only 15 per cent, were the coarse South American lots.⁷⁵ It was not until April, however, that buying became aggressive. Thereafter markets both in Europe and at home found a rapidly improving demand. But in wool as in cotton the fine grades were the chief attractions.⁷⁶ Half-bloods and above were taken at rapidly rising

⁷⁴ Trading in wool "tops," a semifinished product, was begun in New York in 1931. Continental Europe "tops" markets were established before 1900.

⁷⁵ *WCR*, January 29, 1920, p. 70.

⁷⁶ The terminology of wool and yarn may be confusing, and for that reason

prices, while $\frac{3}{8}$ - and quarter-bloods were ignored. The division of attention widened the gap in prices even though both groups were tending upward. But in July, 1919, the quarter-bloods leveled out and went no higher thereafter, whereas the full-bloods and fine staple territories continued their upward sweep until they reached a flat peak, at which they held from February through April in the following year. It is interesting to note, in passing, that the post-war inflation failed to carry the prices of lower grades of wool as high as those set under government control in 1918.

One of the major differences between cotton and wool is in their production periods. The longer growth period of wool, several times that of cotton, gives it a far greater stability in respect to both quantity and quality. A rain, or the lack of one, is not likely seriously to affect the clip. Because of this stability wool prices are far more inclined to follow changes in consumption than are cotton prices. It is no surprise, therefore, to find the relative movements of yarns and the grades of wool from which they are spun to have been almost identical during the year ending August, 1919. But beginning in that month an unusual development arose which showed how generally the quarter-bloods and below were in disfavor and how the trade capitalized this situation. Exempting the spinners' margin, which expanded rapidly, the price differential between quarter-bloods and 2/32's yarn spun from that grade widened far out of traditional proportions. It is significant that 2/32's yarn, while far below 2/40's and 2/50's

a brief tabulation, taken from a larger one given by E. W. Zimmerman (*World Resources and Industries* [New York, 1933], p. 354) is offered:

COMPARATIVE GRADES

WOOL		SPUN U.S. YARN COUNTS
U.S. Domestic (Ohio, Pa., etc.)	U.S. Territory (Western)	
Full-blood (XX)	Fine	60's
$\frac{1}{2}$ -blood (X)	$\frac{1}{2}$	50's
$\frac{3}{8}$ -blood	$\frac{3}{8}$	40's
$\frac{1}{4}$ -blood	$\frac{1}{4}$	36's
$\frac{1}{8}$ -blood	$\frac{1}{8}$	32's

with respect to 1918, nevertheless followed those higher grades in relative movements. The origins of this peculiar development probably are to be found in the government's need for the low and middle grades for war-supply purposes, with the result that these grades of wool were then overvalued with respect to the full-bloods and territories.⁷⁷ The character of post-war demand reversed that relationship. No weaver wanted the lower grades of yarn if he could avoid it. But if he did have to enter the market for them he was charged a price that was made on the basis of a comparison with other yarns, not with the wool from which they were spun. The situation was referred to later when one group in the market was evidently blaming the "producers in the lower grade woollens" for demoralizing the market by dropping their prices 25 cents per yard in mid-April, 1920. The latter, said the former, had taken "undue advantage of the unavoidably high prices . . . in fine worsteds. . . . Buyers observed these [low count] goods moved up closely behind the higher grade leaders with unblushing frequency and relative speed."⁷⁸ It was not until the last quarter of 1921 that low-grade wool and yarn started to return to their normal relationships.

Throughout the fall months of 1919 the entire industry enjoyed the biggest season it had ever known. Cotton's story of allotment, withdrawals of lines, and capacity booking was repeated in the wool-manufacturing trade. The industry was bright in England, too. Prices, especially on such fine grades as Australian Merinos, were soaring. Supplies were plentiful. "There is indeed," said a Bradford report, "so much wool in the country that . . . storage has become a very acute problem."⁷⁹ There and in the United States, December and January were banner months. In December, combs and worsted spindles showed less idleness than at any time since the capacity production of 1918. In January the wide looms were at their maximum employment. Not an economic cloud darkened the wool industry's sky until the middle of February.

⁷⁷ *TW*, July 5, 1919, p. 169.

⁷⁸ *Ibid.*, April 17, 1920, p. 73.

⁷⁹ *Ibid.*, October 4, 1919.

The trade was taken by surprise in the middle of February by a slump in the sale of men's wear. One journal stated:

There is a crisis not very far off. . . . The wholesale manufacturers have made such a decided showing of a disposition to go unusually slow in their operations, that there may be calls for a stimulant if not for a respirator within 60 to 90 days. Prices on goods for the fall season are at such advanced levels that there is considerable fear for the stability of orders.⁸⁰

The raw-wool market was quick to respond. Business on the twenty-sixth was "pretty well in the doldrums." Supply appeared to be catching up with demand. Many lines were reopened and the low-quality fabrics weakened. Some in the trade felt that the "straitened financial status" at Cape Town was one of the most important influences at work.⁸¹ Attention was called to "an immediate slump of 10 per cent in wool prices" as the result of advances in the discount rates of foreign bills initiated by the South African banks.⁸² While financial difficulties in one of the wool markets may have had some effect upon raw-wool prices, it is doubtful that this is the factor which prompted the garment manufacturers to become conservative. On the Antwerp raw-wool market, 12,000 bales of Australian wool were sold on February 27 at prices 5-10 per cent above those a fortnight earlier.⁸³ But in the goods markets continued weakness was reported in the last week of February. Price concessions were made. The announcement of new-priced lines in men's suitings was expected to be made soon. A week later the *Textile World*, in its leading editorial, discussed the possibilities of a "Big Break" and suggested that "the cloak and suit trade may be having a temperamental case of staying out of the market."⁸⁴

In the light of what subsequently came to pass, the cutting-up trade was proved to be right. Wholesale sales of women's clothing slowly but surely drifted downward. Men's clothing sales in February, March, and April were down sharply from the December peak, but made a good showing in May. Employment in these

⁸⁰ *Ibid.*, February 21, 1920, p. 61.

⁸¹ *WCR*, February 26, 1920, p. 35.

⁸² *Ibid.*, January 27, 1921, p. 116.

⁸³ *TW*, March 6, 1920, p. 103.

⁸⁴ *Ibid.*, p. 101.

two lines roughly followed sales. Employment in woolen and worsted mills and loom activity, however, each held evenly through the spring and into May. This disparity is probably due, as we noted in cotton, to the backlog which was estimated in mid-March to be as follows for yarns.

Hosiery yarn production is almost completely covered with orders for at least two months. . . . Combed and fine count carded yarns for 4 to 6 months; . . . staple yarn . . . 3 months, while little thread or tire yarn can be had for delivery this side of October, and practically none prior to July.⁸⁵

The market for wool manufactures is not so diffused as that of cotton. The greatest portion of wool eventually reaches the market as clothing, and for this reason its volume at retail can be more easily reported, although no month-to-month records are available. The delay of spring affected the supply of cotton and sent prices upward. But for wool the demand was affected, and it sent prices, and volume, downward. The acknowledgment was general throughout the trade that "the dull season that the retailers were experiencing" was attributable in great measure to the weather. The February slump in the volume of men's wear, initiated by the cutting-up trade, was followed closely by the discovery that spring retail distribution was falling below expectations. The wool industry did not collapse under this pressure, but the boom was definitely over and something between conservatism and pessimism overhung the trade.

In early March the cutters, still firm in their apprehension of a light manufacturing period just ahead, turned to second hands for their supplies as they needed them.⁸⁶ That they were able to do so indicated that the speculative market was close to its end, and this aroused fears among first hands as to the demoralization which would overtake the market if dumping began. Price concessions were more easily won; and in mid-April woolen manufacturers reduced their prices,⁸⁷ to the considerable dismay and embarrassment of all the other goods manufacturers. From this

⁸⁵ *Ibid.*, March 13, 1920, p. 85.

⁸⁶ *Ibid.*, p. 59.

⁸⁷ *Ibid.*, April 17, 1920, p. 73.

point forward the progress of the contraction is very much like that of cotton goods.

The difference in the behavior of raw-wool and cotton prices is once more observed at the lower turning-point in mill activity. When production suddenly reversed its downward sweep in January, 1921, raw-wool prices were arrested in their fall. The fine wools were stabilized and finally rose in October. Quarter-bloods, still in disfavor, held until June and then gave way for two months before finding a satisfactory demand.

SILK

For the year ending June 30, 1920, the United States imported more than 47 million pounds of raw silk, of which 33 millions came from Japan and about 11 millions from China. Japan consumed about one-third of her crop at home, and practically all of that exported went to the United States. China consumed about one-half of her crop and the United States took about half of that exported. American imports were valued at \$438 millions. In addition there were about \$29 millions in waste and spung-silk imports. The United States also imported silk fabrics during the same year valued at \$50.6 millions, \$44 millions of which came from Japan.⁸⁸ In all, the United States absorbed about 93 per cent of the total raw silk, spun and waste silk, and silk goods exported by Japan.

These figures will provide the reader with a conception of the relative amounts involved in the silk trade of the world during the fiscal year 1919-20, especially of the relationship between Japan, the principal producer, and the United States. The historical point of view, as it relates to our problem, is concerned mainly with price movements.

On the New York market, the raw-silk prices for No. 1 Sinshiu, Japan Filature, were as shown in Table 9.

Our quest for certainty would be at an end if we could dismiss

⁸⁸ Silk Association of America, *Mid-Year Report: The American Silk Trade* (New York, 1920). This association reported to the Department of Commerce for the industry on such subjects as machinery activity, silk deliveries, and plant and warehouse stocks.

the origins of the depression with the simple conclusion that "the crisis of 1920-21 began in Japan in the latter part of 1919 with the break in the price of silk, resulting from overproduction and the Chinese boycott of Japanese goods,"⁸⁹ or if we could consider the Japanese crisis (April, 1920) itself as one of the major causes of the American contraction.⁹⁰ But the facts surrounding the crisis, the silk market, and the collapse in the price of raw silk, when studied carefully in their American setting, do not seem to confirm either of these more or less commonly held views. Obvi-

TABLE 9*

Annual average 1914-15.....	\$ 3.24 per pound
Annual average 1917-18.....	6.01
Annual average 1918-19.....	6.88
Aug. 22, 1919.....	9.00
Sept. 26, 1919.....	9.60
Oct. 24, 1919.....	11.20
Dec. 26, 1919.....	13.25
Jan. 23, 1920.....	17.45
Feb. 6, 1920.....	16.25
April 16, 1920.....	11.75
April 30, 1920.....	9.50
June 4, 1920.....	6.00

* Silk Association of America, *Mid-Year Report: The American Silk Trade* (New York, 1920), pp. 28, 29. Some notion of the value which a pound of silk had reached at its peak is obtained by reference to silver, which, then at record prices, could be purchased at a little over \$21.00 per pound.

ously, the Japanese crisis was the direct outgrowth of the raw-silk debacle in January, 1920; and, if initiating causes are to be found in silk, we shall find them in events leading up to that market break. One does not wish to minimize the bearish influence which the news of the Japanese crisis in April exerted upon the minds of those speculatively engaged, but the Japanese news bulked very small in proportion to all the other bearish events which were piling up of their own accord at the same time, much closer to American traders and bankers generally. Instead of

⁸⁹ U.S. Congress, House, Joint Commission of Agricultural Inquiry, *The Agricultural Crisis and Its Causes* (House Rept. 408 [67th Cong., 1st sess.; Washington, 1922]), Part I, p. 59.

⁹⁰ Cf. B. H. Beckhart, *The Discount Policy of the Federal Reserve System* (New York, 1924), pp. 381-84, and Marsh, *op. cit.*

being a precipitating cause, the crisis seemed to be taken simply as one more datum to confirm opinion already well formed. Expressed another way, the course of opinion and events in America would have been little altered had Japan suffered no crisis. Since our primary concern for the moment is silk as a member of the textile group, we shall turn to a review of the developments which preceded and followed the collapse of the raw-silk market.

Silk finds its way into articles of apparel either through the weavers and cutting-up trades or via the knitting machines. The 1919 *Census of Manufactures* reports the value of silk manufactures at \$688 millions, of which \$58 millions went to the knit-goods industry as yarn—\$40.8 millions for hosiery and \$9.7 millions for fancy knit goods. There are no records prior to January, 1920, which show the delivery of raw silk. Even if there were, "delivery," in the case of raw silk, means merely "out of warehouse"; and the raw silk may go either to dealers or to plants which may or may not use it at once. There are no data on spindle or loom activity for this period to reveal the operations of the plants. Of the two series which do exist—imports and employment in silk and rayon goods—the latter is the best and practically the only indicator of activity in the entire silk trade—from raw silk to wearing apparel. Two other series exist and have been referred to earlier—dry-goods wholesale volume and employment in dyeing and finishing—but they are of doubtful help because they relate to all textiles rather than to silk alone. Price records for raw silk are adequate, and there are fair data for broad silk prices. No retail price data exist.

The post-war demand for luxuries found gratification in silks, and the bales of raw-silk imports shot upward through September, 1919. July demand for yarn exceeded supplies, and by August the spinners were sold to capacity to December or the following March. Trading was light simply because no unsold yarn appeared. The demand for silk hosiery was unrelenting. "We are making a luxury stocking," the trade claimed.

During the fall months the raw-silk market rose steadily. Competition was sharp for the limited supply. "So many new branch mills are trying to get under way," explained a reporter, "that

the available stocks fail entirely to be enough to go around."⁹¹ In Yokohama, factors were optimistic over the probability of still further price jumps. In November, Sinshiu No. 1 climbed steadily, and the Japanese bought American textile machinery in increasing quantities even when delivery could not be promised for eighteen months. January saw a full-fledged speculative boom in Yokohama, in which the contract grade was run up to 4,160 yen from 3,430 yen between the third and the nineteenth of the month. On the next day it advanced another 100 yen to 4,260. The New York market tagged along practically on a nominal basis, for there was very little silk passing. As a matter of record, the whole month of January in New York was characterized by the relative absence of business. "Business in the raw silk market has been reduced again by the tendency of prices to go soaring in Yokohama and Canton."⁹² On the last of the month the condition was unchanged. "The Yokohama market is fairly active. On the local [New York] market buying has been dulled by the high prices and evidences of unrest in the factory districts."⁹³

That the January run-up in price was purely the result of speculative activity in Japan seems to be evident. In addition to the conditions obtaining in Japan, to which we shall return shortly, there was evidence of restraint in the silk-goods market at home. In December press reports of huge stocks of raw silk hidden in New York began to circulate. Traders at first gave little heed to these reports because experts seemed to agree that there were no more than 50-60 thousand pounds available, but by mid-January the trade began to accept the possibility of hidden stores. "There undoubtedly is heavy stock in New York warehouses," reported the *Textile World*. "No system of collecting data of the New York stocks is in effect but a careful canvass of the matter shows evidence of large holdings here, undoubtedly mostly sold."⁹⁴ The fear was gradually confirmed, and the uncertainty as to how much actually was stored was perhaps more depressing than the facts would have been. "A large amount . . . was accumulated

⁹¹ *TW*, November 15, 1919, p. 104.

⁹³ *Ibid.*, January 31, 1920, p. 109.

⁹² *Ibid.*, January 3, 1920, p. 157.

⁹⁴ *Ibid.*, January 17, 1920, p. 75.

in reservoirs outside the accustomed depositories," declared a convention speaker, "and just as we felt at one time that there would not be enough silk to go around, we have come . . . to the conclusion that every barber shop, grocery store, and garage is brim full of bales of raw silk."⁹⁵

The fear of hidden supplies was one thing which dampened American dealer demand, but there was the additional fear that recent price increases in the raw material, when incorporated eventually in the finished article, would make a price at which the customer would balk. According to one silk reporter: "Matters are not going very well in the goods market either. An advance of 25 per cent was considered to be the limit procurable on piece goods this year and conditions indicate that such a rise will hardly cover the extremes in sight."⁹⁶ In the hosiery market, prices had reached the point "where jobbers at least were becoming more cautious in their attempts to operate" and a diminution of demand was perceptible even though the requirements of buyers had not seemed to lessen. Full-fashioned hose in all silk were bringing up to \$45.00 per dozen, and it was beginning to be feared that no more could be obtained. The particular circumstances which earlier had contributed to intense pressures for raw silk now became the mechanism by which a slowing-up in the demand or even a slight regression might take place. The plants, booked to capacity for three to six months and covered for supplies, could afford to wait out the market. That they were doing so is shown by the cable reports from Japan. The one dated January 21 states that "the market was active . . . but latterly it is said that Americans are refraining from bidding for the time being."⁹⁷ The cable for February 4 reported that "the rise shot way over mill ideas and concerted action was afoot to close buying until a more settled condition could be assured. The mills have not let up in their campaign of resistance."⁹⁸

⁹⁵ Speech of George M. Dunlop before the National Wholesale Dry Goods Association Convention, New York, January 18 (see *WCR*, February 3, 1921, p. 62).

⁹⁶ *TW*, January 31, 1920, p. 109.

⁹⁷ *Ibid.*, January 24, 1920, p. 117.

⁹⁸ *Ibid.*, February 14, 1920, p. 81.

We may now return to the conditions prevailing in Japan. Between March, 1919, and March, 1920, the general price index rose without interruption and at a rate about 30 per cent faster than that of the United States. Japan's note issue had increased rapidly during the war, but so had her gold reserve. Her exchange was above par all during 1918 and 1919, falling gently during 1919.⁹⁹ On January 23, 1920, it crossed below and fell rapidly to a discount of 5.7 per cent by March 23. From there it climbed sharply back to a premium of 4.8 per cent on May 11, from which it gradually receded to par at the end of the year. Japan had grown prosperous on war trade. New business enterprises were mushrooming, and stock companies were being promoted at a rapid rate during 1919 because the foreign demand had continued to expand after the war. The rapid increase in promotional schemes brought a sharp warning from Premier Hara shortly after the turn of the year:

The large number of joint stock concerns of all sorts, which are now being promoted, can hardly be regarded as a healthy economic sign, and judging from what happened after the conclusion of the Russo-Japanese War, it is not improbable that the crash may come at any moment.¹⁰⁰

The boom psychology in Japan is apparent. She "felt that she had the whole world as a market and inflation was the order of the day."¹⁰¹ Speculative activity, related specifically to raw silk, moved boldly under the aegis of insatiable demands from America. Since the United States was then absorbing about 93 per cent of Japanese silk exports, the plans of all dealers would be predicated on guesses as to what American buyers would do. The persistent urgency of American demand, the indifference to prices, a continual flow of reports of scarcity and underproduction even at plant capacity, would lead any dealer into an unqualified faith that the situation would remain unchanged for some time. A

⁹⁹ U.S. Congress, Senate, Commission of Gold and Silver Inquiry, *Foreign Currency and Exchange Investigation* (Ser. 8, by H. N. Lawrie) ([67th Cong., 4th sess.; Washington, 1924]). The daily rates for eighteen currencies are given for the period November 1, 1918, to October 31, 1924.

¹⁰⁰ Quoted in Charles Hodges "The Collapse of Japan's After-War Boom," *Review*, II (May 29, 1920), 582-84.

¹⁰¹ Comment of Frank Chipman after his return from a four weeks' study in Japan of the textile business before the crisis (see *TW*, July 10, 1920, p. 32).

speculative run-up in raw silk was the result. Prices reached their peak on Tuesday, January 21, but American interests had dropped out of the market. As the Sakellaridis dealers in Alexandria were doing at the same time, the Japanese traders overestimated the sacrifice which Americans would make to obtain goods. They had bid themselves out of the market, and the consequences could be only one thing for those who had borrowed heavily to stay in the game. A glance at the chart of raw-silk prices reveals the precipitous liquidation which finally carried all of Japan with it. We need not go into the details of the crisis, which reached its climax in the last half of April.¹⁰² Banks and firms closed their doors, commodity and stock exchanges closed and reopened and closed again, and the minister of finance felt obliged to announce on the twenty-first that "some merchants . . . have become involved . . . to some degree. . . . The condition cannot be called a panic."

An event which, though not an efficient cause of the break in silk, was nevertheless extremely trying at a crucial moment, was the breaking of the Pacific cable between San Francisco and Guam just at the peak of the speculation. The structure of the Yokohama market was such that a large share of bidding was done by cable. The New York dealers, if they were not already out of the market by volition, were practically thrown out by accident.

The League of Nations in 1927 published a memorandum, which very plausibly argued that exchange rates may have played an important role in the collapse of raw silk.¹⁰³ A superficial survey, indeed, suggests that a very close connection between exchange rates and the silk failure did exist. The maximum premium of gold in London, the turning-point in the pound's relationship to the yen and the dollar, and the peak of raw-silk prices all occurred within the space of the few days between January 20 and February 5. Silver too was in the picture. Its last high stand against the gold dollar was on January 12, and it gave way against the pound on February 11. It requires considerable te-

¹⁰² Cf. *Chronicle*, April 24, 1920, p. 1699; May 15, p. 2024; May 29, p. 2242; June 5, p. 2340.

¹⁰³ League of Nations, Economic and Financial Section, International Economic Conference Documentation, *Natural Silk Industry* (Geneva, 1927); cf. esp. p. 8.

merity to declare that these events were unrelated to the silk crash, especially when the far eastern dealer's sensitivity to matters relating to monetary metals and exchange rates is taken into consideration. Yet the collapse of silk was in fact independent of exchange influences.

The market for silk was made in America. The Yokohama silk market merely reflected that demand until, in January, its traders took matters into their own hands. If exchange had been an important factor, it would have worked in favor of still higher prices, which the Americans could offer because the yen had been slowly sinking for more than a year. The exchange movement could offer no cause for the reversal in silk prices because it merely continued its course until March 23. The possibility that silk dealers, eying other things than American demand and dollar exchange, were given pause by the change in the dollar-pound relationship, must be ruled out because silk had fallen from 4,260 yen to 3,800 yen before February 4 when the pound reached its nadir. The decline in silver is a much more likely argument in support of the exchange theory of silk prices. Traders, seeing the last high price in silver in the United States at \$1.37 on January 12, might have feared a loss of Chinese purchasing power through that source. But this fact as an efficient trading influence can be discounted at least up to March 23, because the yen was falling about as rapidly as silver. Hence the Shanghai-Yokohama rates were relatively undisturbed. The Chinese boycott, beginning six months earlier, would have been a far more potent source of worry to Japanese businessmen. The influence of exchange rates as important trading factors is not to be denied; but, in the day-to-day influences at work in the silk market between January 20 and February 5, it is impossible to find any evidence that bullion or exchange carried any weight.

As for the crisis that broke out in Japan during April, no one would seriously contend that it was not the direct result of the raw-silk crash. A period of more than three months elapsed between the two events, and, of course, certain factors intervened either to accelerate or facilitate the ensuing process of financial disintegration. Six of the outstanding ones can be listed: (1) the

increasing commercial-paper rates and the raising of the bank rate, (2) the Chinese boycott, (3) the reversal of the favorable balance of trade and its consequent burden upon gold reserves, (4) the loss of markets through the re-entry of foreign countries into their old trading relationships, (5) the decline of purchasing power of silver-standard countries, and (6) the loss of cargo revenues to the return of peacetime fleets.

The fall of the raw silk in Japan brought prices tumbling in New York, especially in second hands where speculation by interests outside of the regular silk trade had developed extensively. The lack of cabled information probably helped to stimulate fear, and by the last two weeks in February the silk market was "chaotic." The slackening jobber demand and the timidity of the cutters during January and February showed up in the employment figures during March. The unseasonable spring weather slowed retail sales. But, as a matter of record, the consumer demand for silks, especially hosiery, was not dead. On the contrary, hosiery demand picked up in April and May and appeared to continue strong into July. The position of the market for silk piece goods, however, was, by the end of May, "the most acute of any division of the textile industry."¹⁰⁴ The demoralization, caused by the liquidation of speculative holdings of raw silk and of piece goods, was greater in such sections of the silk trade than the diminution of consumer demand would account for. The liquidation probably carried prices further than they would otherwise have gone.¹⁰⁵ The sharp recovery of raw silk in September, 1920, effected by the re-establishment of order in Japan and by a close control by the Imperial Silk Syndicate, is consistent with this view.

The recovery in plant activity was similar in all respects to that of cotton and wool. The speed at which it returned to average levels can be explained only on the basis of the hypothesis

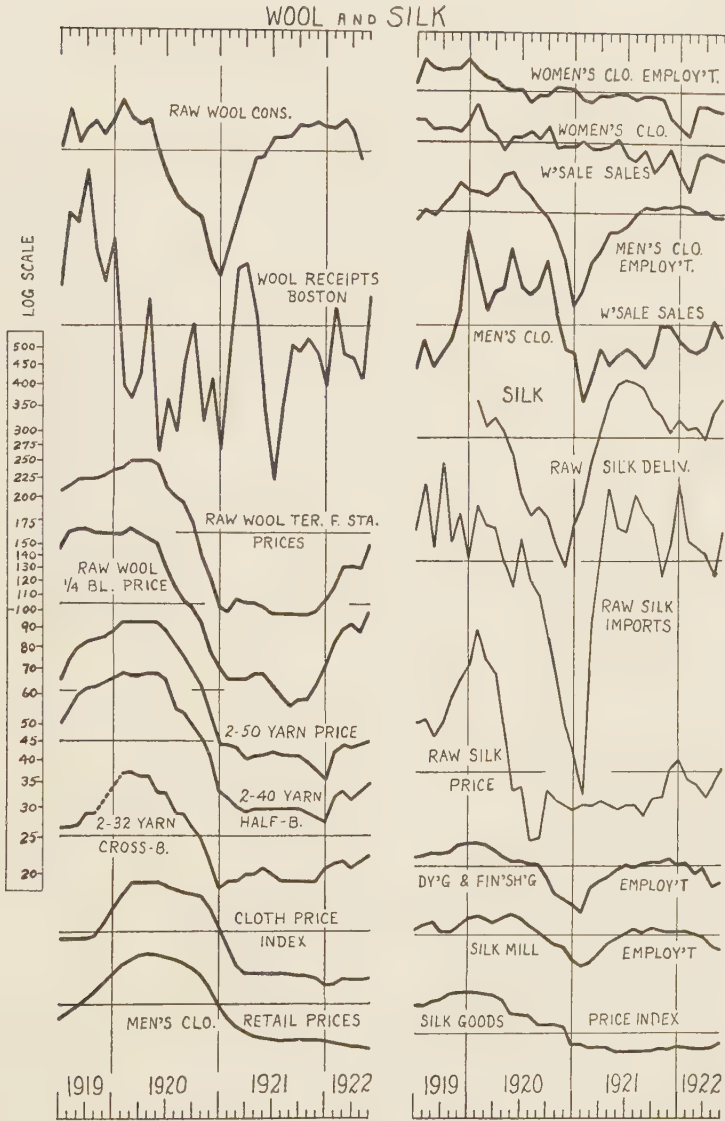
¹⁰⁴ *TW*, June 5, 1920, p. 98.

¹⁰⁵ The Fairchild index of piece goods does not reflect this drastic drop. But it is based on asked prices of established firms whose prices, as we noted in other lines, were largely nominal quotations and not the actual prices at which goods moved, especially out of second hands.

WOOL AND SILK

- Raw-wool consumption. Adjusted for seasonal. U.S. Bureau of Agricultural Economics.
- Wool receipts, domestic and foreign at Boston. Adjusted for seasonal. Boston Chamber of Commerce.
- Raw wool, territory, fine staple, scoured basis, price at Boston. U.S. Bureau of Agricultural Economics.
- Raw wool, quarter-blood combing, Ohio and Pennsylvania fleeces, grease basis, price at Boston. U.S. Bureau of Agricultural Economics.
- Worsted yarn, 2/50's domestic, price. U.S. Bureau of Labor Statistics.
- Worsted yarn, 2/40's half-blood, price. U.S. Bureau of Labor Statistics.
- Worsted yarn, 2/32's crossbred stock, price. U.S. Bureau of Labor Statistics.
- Wool cloth. *Textile World*, wholesale-price index.
- Men's clothing. National Industrial Conference Board, retail-price index. Aggregate budget less shoes.
- Women's clothing, factory employment. Adjusted for seasonal. Federal Reserve Board.
- Women's clothing, wholesale sales in New York. Adjusted for seasonal. Federal Reserve Board.
- Men's clothing, factory employment. Adjusted for seasonal. Federal Reserve Board.
- Men's clothing, wholesale sales in New York. Adjusted for seasonal. Federal Reserve Board.
- Raw-silk deliveries to American mills. Adjusted for seasonal. Three-month moving average, centered. Silk Association of America.
- Raw-silk imports. Adjusted for seasonal. U.S. Bureau of Foreign and Domestic Commerce.
- Raw silk, average of weekly prices, silk filatures, Kansai No. 1 at New York. U.S. Bureau of Labor Statistics.
- Dyeing and finishing, factory employment. Adjusted for seasonal. Federal Reserve Board.
- Silk and rayon goods, factory employment. Adjusted for seasonal. Federal Reserve Board.
- Silk goods, Fairchild price index. End-of-month prices of domestic and five Japanese numbers.

CHART VI



given in the case of cotton manufactures. In December, 1920, reports of a better movement of goods, a larger interest on the part of jobbers and dress manufactures, and a satisfactory "near-by" volume foreshadowed the upturn.

In measuring the total effects of the collapse of raw silk at the end of January and of the April crisis in Japan upon the plans of businessmen in America, it is necessary to reject the notion that they bulked large as a precipitating cause of the general liquidation here. With respect to the number of people affected, raw silk, a very specialized commodity, touched an insignificant group of traders when compared with those interested in the movement of stock prices, which gave way in the second week in November, 1919, or with those affected by the fall in cattle prices in August of that year. It is impossible to agree with the Federal Trade Commission's conclusion, in its cotton study, that the first indications of deflation "appeared in Japan early in 1920."¹⁰⁶ If this statement referred to the price of raw silk, then those to whom deflationary tendencies appeared numbered very few. The collapse was antedated by other and more far-reaching price movements. If it referred to the crisis, the rejoinder must be that at that late date there were already so many domestic "indications" that its primacy is doubtful. Professor Beckhart, looking at the crisis from the banking point of view, declared that "the crisis in Japan was not lost on the American people. It served as a lesson and a warning to banks and firms. The business community became more cautious and was less confident of the future."¹⁰⁷ This summary is qualitatively true but gives far too much weight to the place that the crisis had in the mind of the business community. The attractiveness of the crisis as an object to place first in the parade of depressive factors is understandable, for it was precise, objective, visible, datable, and the first nation-wide breach in the world's post-war boom. While it is correct to say that the business community became more cautious after the middle of April, it is out of tune with the facts to attribute this caution to the Japanese affair.

¹⁰⁶ *Preliminary Report on the Cotton Trade* (1923), p. viii.

¹⁰⁷ B. H. Beckhart, *The Discount Policy of the Federal Reserve System* (New York, 1924), p. 384.

CHAPTER V

IRON AND STEEL AND THEIR PRINCIPAL USERS

AS WE begin our consideration of the post-war experience of the steel industry, it will be helpful to explain the general outline of approach. We shall first review the principal experiences of the steelmakers as an industrial group during and after the war; second, the specific influences at work in each of the markets for several classes of finished rolled products; third, the ironmakers; and last, the coking industry.

The reason for first reviewing the steel industry as a whole, apart from the specific products which it rolls, may require a word of explanation. It is true that the steel market is not a single, integrated one, but a series of rather highly articulate markets for specific classes of finished steel, each market being largely dominated by the raw-material needs of some particular industry, and that, therefore, a report of the total, over-all steel situation at a given moment often presents a confusing and contradictory picture. But, since there are at the same time some events and influences which are common to all the steel markets, we shall avoid repetition if we first survey the steel industry as a unit and in this manner provide a setting for the later consideration of the particular markets.

THE STEEL INDUSTRY AS A WHOLE

A recession in the price of steel, beginning in April, 1913, was not interrupted by the outbreak of war in Europe. It was not until January, 1915, that an improvement appeared. Once started upward, however, the price of steel climbed in an unbroken and accelerating speed until, by July, 1917, it had almost trebled its 1914 level. Not only had the price swept upward, but the price structure itself had become chaotic. There was not one, there were many, prices for a specified grade of steel. The disorganized state of the market was such that differences as great as

\$30 per ton were being recorded in the purchases of steel by the various departments of the government.¹ The War Industries Board later described these conditions as follows:

The quantity of steel available in the market was small; mill capacity had been sold up for months ahead; and market prices reflected the scramble to secure the unpledged output. These prices charged to late-comers bore no relation to the cost of production. Current deliveries on long-time contracts were at prices much less than those in the open market, though large premiums were paid for prompt shipments.²

The steel situation had become so desperate that, on July 12, 1917, President Wilson was obliged to issue an appeal for a one-price-for-all policy³ in behalf of the interests of national defense and to call the steel men to Washington for a conference looking

TABLE 10

	July, 1917	October, 1917
Coke.....	\$12.25	\$ 6.00
Basic pig iron.....	52.20	33.00
Billets.....	95.00	47.00 (Nov.)
Steel bars.....	cents 4.50	2.90
Steel plates, tank.....	cents 9.00	3.25
Black steel sheets.....	cents 8.00	5.00 (Dec.)

toward price stabilization. With the prospect of a fixed level of prices much below those current, buyers and sellers alike held off commitments, the reckless bidding ceased, and a more orderly market emerged. "On September 24, the President approved an agreement between the War Industries Board and the steel men, fixing maximum prices on ore, coke, pig iron, steel bars, shapes, and plates . . . subject to revision January 1, 1918."⁴ The extent of the downward revision in prices effected by the agreement is shown in Table 10.

The new policy brought order into the iron and steel markets, and prices were not changed significantly until the end of 1918.

¹ H. B. Vanderblue and W. L. Crum, *The Iron Industry in Prosperity and Depression* (Chicago, 1927), p. 28.

² U.S. War Industries Board, *History of Prices during the War: Prices of Iron and Steel and Their Products* (Washington, 1919), p. 20.

³ Vanderblue and Crum, *op. cit.*

⁴ U.S. War Industries Board, *op. cit.*

The revisions of that date were reconsidered in March, 1919, by a conference between George Peek, chairman of the United States Department of Commerce Industrial Board, Attorney-General A. M. Palmer, and representatives of the steel trade.⁵ A reduced schedule of prices was announced on March 21; and, in view of its importance for the steel industry during the succeeding two years, it is well to take note of some of its principal items (Table 11). This schedule is important because, throughout the violent price movements which followed, the United States Steel Corporation did not deviate from it in any significant detail.

TABLE 11

Pig iron, Foundry No. 2	28.50 dollars per ton
Basic pig iron	25.75
Bessemer steel billets	38.50
Soft-steel bars	2.35 cents per pound
Steel plates, $\frac{1}{4}$ -inch tank	2.65
Hot-rolled sheets No. 28	4.35
Structural shapes	2.45

The March agreement did not halt the downward movement of prices which began with the termination of the war and which was accelerated by the suspension of certain types of ordnance work early in 1919. The decreased rate of operations was welcomed by the iron and steel men as an opportunity to make repairs and put their furnaces back into first-class shape.⁶ Their breathing spell was short, however, for heavy demand, originating with almost every class of rolled-steel user, reversed the trend of operations in June, and this was followed by price improvements scattered throughout the remainder of the year.⁷

⁵ *Iron Age*, March 27, 1919, pp. 814 ff. (hereafter cited as *IA*).

⁶ Vanderblue and Crum, *op. cit.*

⁷ The composite price indices of finished steel and of pig iron by *Iron Age* and of iron and steel by the *Iron Trade Review* show the recession continuing through July in iron and through September in steel. For reasons which are not apparent, the monthly price quotations for the seven items given above in the March schedule show no change between April and September (in some cases December), 1919. The market quotations upon which the monthly averages are based clearly appear to have been exclusively those of the independent iron and steel interests and not, as

The resurgence of activity in June and July, 1919, was accompanied by signs of labor difficulties. Sheetmarkers in Chicago and Pittsburgh were receiving orders in excess of production, and some had closed their books. Much of this demand came from interests which should have placed orders in the second quarter but had held off because of business uncertainty. Automobile and farming-implement manufacturers were heavy buyers, and the Republic Iron and Steel Company resumed operations in Moline to serve the farm-tool demand.⁸ Lapweld pipe for the oil fields was in urgent demand, and the makers' schedules were in such a state that an order for 70 miles of 8-inch pipe could not find a taker. Production in some finished-steel lines, reported the *Iron Trade Review*, appeared to be "nearing the maximum point permitted by the supply of labor."⁹ It was in this setting that the labor disorders were beginning to appear. Leaders of twenty-four American Federation of Labor steel unions met in Washington in mid-July and demanded a strike vote¹⁰ for the purpose of obtain-

might have been possible, a weighted average of the independents' and the U.S. Steel corporation's quotations. The 1920 monthly price averages given in *Metal Statistics* are specifically declared to be those of the independents. All the price series, however, from whatever source drawn, suffer the same kind of fault which we have noticed elsewhere: their representative character is doubtful; they represent seller quotations more often than the actual prices at which goods were moved. Too often the interests of the producers color the quotations they give to market-reporting agencies. The desire not to appear to have broken away from official stabilization agreements and the wish not to make the market look weak are two strong deterrents to accurate price-reporting. Another difficulty which stands in the way of an accurate price picture is the failure of price reports to distinguish between prompt and forward quotations. In periods of rising demand, forward prices may be officially quoted, whereas spot or near shipments command a premium. For instance, in the spring of 1920 when no forward tonnages of coke were available, spot prices went as high as \$12.00-\$14.00; yet the price appears to be that of the fixed level—\$6.00. Again, near the end of 1919 when practically no sheet tonnages were available, high premiums appeared on prompt shipments; yet the quoted prices remained as they were in March. In short, when order-books were closed, quotations had little relevancy to spot prices.

⁸ *Iron Trade Review* (later *Steel*), July 10, 1919, p. 71 (hereafter cited as *ITR*). Trade journals fluctuate in reportorial excellence. For the explanation of events of this period I have drawn more heavily upon the *Iron Trade Review* than upon *Iron Age*.

⁹ *ITR*, July 17, 1919, p. 137.

¹⁰ *IA*, July 17, 1919, p. 169.

ing a closed shop, rate increases, and the check-off. At the end of August, William Z. Foster, secretary of the organizing committee, reported that union members had voted to strike and that thirty thousand employees would walk out if union demands were not met. President Wilson issued an appeal that the strike be put off until a conference between millowners and labor could be convened and asked President Gompers to use his influence to that end. John Fitzpatrick of the organizing committee announced, however, that "the strike has to come if we are turned down, despite the plan of President Wilson,"¹¹ and the strike orders were issued for Monday, September 22.

The initial effect of the nation-wide steel strike was to halt production. Most of the Chicago furnaces were banked, Bethlehem's plants were all closed, and, in the Mahoning Valley, Carnegie Steel banked all its furnaces for the most complete shutdown in the history of the Valley.¹² The strike's effectiveness, however, was temporary, and by October 2 thousands of men were returning to work. By October 16 *Iron Age* reported that the strike had ceased to be regarded as a major factor. It is, nevertheless, noteworthy that both iron and steel production suffered most during October. A total of 2 or 3 million tons was estimated to have been lost before the strike was finally called off on January 8.

Not long after the major initial effects of the steel strike had passed, another strike which was to have equally grave consequences broke out in the bituminous coal mines. One major consequence of the steel strike was to increase the scramble for spot metal and to heighten the demand for positions on rolling-mill schedules. Warehouse and jobber stocks were cleaned out. In the midst of this situation the prospect of a crucial fuel shortage emerged. Near the end of October, 1919, various finished-steel producers, in anticipation of the coal strike, began to refuse new business, to make no forward quotations, and to withdraw those outstanding. The miners went out on November 1, and, although President John L. Lewis withdrew the strike order on November 11, they were slow to return.¹³ November coal production was cut

¹¹ *Ibid.*, September 11, 1919, p. 740.

¹² *Ibid.*, September 25, 1919, p. 898.

¹³ *Coal Age*, November 13 and 20, 1919, p. 809.

by more than half, and reserve stocks were so drawn down that the government, acknowledging the imminence of a fuel famine, undertook to allot coal to certain industries in the order of their importance to the public welfare and to requisition coal cars to that end. H. A. Garfield, fuel administrator of the Central Coal Distributing Committee, limited the distribution of coal to the first five classes of the priority list. Since the coke, iron, and steel groups were not in the first five classes, they faced an acute shortage. The Coal Committee also, on December 8, restored wartime price limits (under the Lever Act) to coke after Connellsville coke had jumped nearly 100 per cent in three days.

The effect of the coal curtailment on steelmakers and steel-buyers alike was electric. To the buyers, price was secondary to delivery. Practically every important industry using large quantities of steel was at or close to its maximum activity. On the other hand, the steelmakers were hard beset. The *Iron Trade Review*, in its December 11 issue, reported some of the outstanding consequences of the fuel shortage: "In the Youngstown district several large plants have suspended completely. A leading Pittsburgh independent has been reduced from practically 100% to not over 60% operation. Only 8 out of the 12 blast furnaces at Gary and 5 out of 11 at South Chicago are still running." Elsewhere on that date the same journal describes the natural result of crippled production and booming demand:

New steel orders no matter how attractive in size or price have been going begging. Many mills have closed their badly congested order books. . . . A Detroit automobile manufacturer has been seeking in vain to place 100,000 tons. . . . In the East mills have enough tonnage of steel bars to run into the third quarter and are selling considerable tonnage at 3.50¢ Pittsburgh against the regular level of 2.35¢ Pittsburgh.

With this editorial recognition of the break between the independents' and the U.S. Steel Corporation's price policies, we have the beginning of a situation which appears to be without parallel in the history of steel. From the latter days of November, 1919, onward into the late spring of 1921, a two-price system existed in the steel market, the U.S. Steel Corporation holding rigidly to the March 21 price schedule and the independents shaping their price

policy purely in accordance with the rapidly changing tides of supply and demand.¹⁴ This price fissure, once started, widened rapidly and ranged from as much as \$50 a ton above U.S. Steel, for certain materials during 1920, to \$10 under in 1921.

Steel entered 1920 with its books filled with as many orders as millowners would accept and the market overwhelmingly sellers'. Buyers found it extremely difficult to get assured tonnage at any price; delivery was on a "when possible" basis, with very few classes of rolled-steel products promised under three months. Much of the rolling capacity was booked into the third quarter and some of it into the fourth. Sheets were practically unobtainable; lapweld pipe-makers were sold through the year; merchant bars were scarce. These conditions prevailed throughout the first quarter; and it was to be many months before steel presented so uniform a picture in all its branches.

At the beginning of the second quarter two mutually aggravating conditions developed to harass the steelmakers further in their effort to hold ground against the flood of orders. The fuel shortage was not ended with the coal miners' return to work, and railroads were already becoming bogged with their burden of traffic. It was at this point that the nation's switchmen and freight handlers went out on an unauthorized strike, which completely snarled up the movement of goods. By April 15 the steel industry was almost paralyzed. At one end fuel supplies were cut off, and at the other end finished rolled steel piled up in the yards. This time the Interstate Commerce Commission in the public interest placed the coal cars in the service of the top priority groups, and the steel industry was obliged to depend on its coal reserves, wherever it had any, and on other kinds of cars or other transportation for delivering its output.

Fifty-five blast furnaces were banked for want of fuel by mid-April. By the end of the month, operations in the Pittsburgh area were down to 50 per cent, and the Mahoning Valley was out completely. Operations for the country were estimated at 50-65 per cent. At the end of May only ten of the sixty-six Mahoning Valley open-hearth furnaces were going. On the distribution side steel-

¹⁴ *ITR*, January 6, 1921, p. 76.

makers were equally beset. Virtually all shipments of finished products were stopped by the third week in April. The Pittsburgh and Youngstown districts were helped somewhat by the use of "trainload shipments," where buyers were willing and able to take steel in such quantities. In mid-June the Duquesne and Carnegie mills were closed to all except truck shipments, and the Homestead mills were shut down. The use of open-top coal cars had been denied the coke-, iron-, and steelmakers—unless loaded for points "on line" to the coal mines; and in July this order was extended by the Interstate Commerce Commission to August 21, although modified to exempt cars with sides less than 36 inches. The shortage was not confined to coal cars, of course, but to all classes. On one day in early July the U.S. Steel Corporation was without a single car for the output of nine plants. At that time the steel industry reported officially to Washington authorities that mill accumulations of materials ready for shipment amounted to 1.4 million tons in flour principal producing districts, excluding eastern Pennsylvania and Chicago. With these totals added, the sum probably reached 2.0 million tons¹⁵—about one whole month's output of finished rolled steel. The importance of transportation facilities to the iron and steel industry can be readily appreciated in light of the fact that about 6 tons of freightage are involved in the production of every ton of steel. The freight-rate structures as well as fast and dependable service are of vital concern to both the steelmakers and the steel-buyers. Thus a breakdown in service or a change in rates introduces great confusion and invites the rearrangement of the plans of every firm making or using steel.

On top of the traffic snarl which was demoralizing the steel trade, the Interstate Commerce Commission introduced a further element of confusion at the end of July by authorizing an increase in the freight rates on September 1, which, it was estimated, would add about \$125 millions a year to the nation's steel bill. The rate increase amounted to about 40 per cent in the eastern territory. This authorization did not come as a surprise; in fact,

¹⁵ *Ibid.*, July 15, 1920, p. 141.

as early as May the prospect of it had been felt to be influencing third-quarter commitments.¹⁶

Before the traffic snarl could be unraveled (it was considerably helped when the Interstate Commerce Commission made 15,000 more cars available to the steel trade around the first of August) definite signs of the disintegration of demand were certainly beginning to appear early in the second quarter. Since the course of the steel market will be studied in connection with specific steel products, we need not enter into great detail here, but it will not be out of place to outline briefly a few of the main developments.

Overseas, the iron and steel trades in Great Britain were brought to a standstill in early October, 1919, when the railway men went out on a strike. Freight congestion was still a controlling factor as late as December; but demand continued fairly strong until June, 1920, when prices gave way. Belgian prices weakened in May, as did those in Sweden. The state of the German market cannot be gauged by price alone because of the monetary disorganization. Civil disturbances in the Ruhr district, where Spartacus workmen's organizations were active, caused grave concern among steel men who, as early as the first of April, 1920, closed out their holdings at lower figures.¹⁷ The crisis in Japan brought cancellations throughout May of large tonnages earmarked for the Orient. Although exports of American iron and steel rose rapidly during all of 1920 to reach a peak in January, 1921, thus evidencing a vigorous foreign demand, the events

¹⁶ At the invitation of the Interstate Commerce Commission, carriers in May, 1920, filed petitions for freight-rate increases amounting to about 30 per cent. Before the new rates were determined but after the hearings had been completed, the United States Railroad Labor Board, on July 20, ordered wage increases amounting to \$618,000,000 annually. This amount was immediately included in the rate petition by common consent, and the commission's report (*Increased Rates, 1920*, p. 220), issued July 29, recommended rate increases ranging from 25 per cent in the Mountain-Pacific territory to 40 per cent in the eastern territory. The carriers were authorized to make the new rates effective August 26, 1920, after five days' notice (see Interstate Commerce Commission, *Annual Report, 1920* (December)). The response of the steel companies was not uniform. Generally, the independents lifted prices but not on all products. U.S. Steel warehouses followed suit, but it appears that the corporation itself took no action.

¹⁷ *ITR*, May 6, 1920, p. 1319.

abroad are recalled here to show the kind of news with which the domestic makers of steel were confronted during the second quarter of 1920.

At home some large independent bar manufacturers offered tonnage to the agricultural-implement companies for July 1 delivery at the U.S. Steel Corporation's price level of 2.35 cents. This was in the second week of April, and it is a little surprising to discover the availability of steel at that time on such short delivery. Furthermore, at least some of these same mills had been quoting 3.00-3.25 cents only a week earlier. At the same time the frantic bidding of sheet stock by the automotive industry (to which we shall refer later) was probably passing its peak. Whether this action was related to the emerging financial difficulties of the automotive trade is not certain. The exceedingly large stores of unshipped automobiles consuming credit at Detroit while awaiting railroad-car service and the action of the Kansas City banks in curtailing loans on automobiles certainly had not escaped manufacturers' notice.

During the last week in April and the first few days in May, signs of lessening demand multiplied. Resales of orders canceled by Japan began to appear in the bar market, and plate prices weakened when the demand for ship material slackened. The abandonment of many building projects in mid-May, attributed to high costs, brought suspensions to the makers of fabricated structural-steel shapes. Rumors of changes in steel price all along the line sprang up with the news that freight rates probably would be lifted in September. In the latter part of May the Illinois Steel Company reopened its barbooks after being out of the market for months, and a large Youngstown steel interest, in what appeared to be "actual retrenchment," reduced its clerical force by 20 per cent. This incipient contraction in steel demand during April and May appears, through many bits of evidence, to be a sort of dividing-point between those lines of steel which were subsequently to come back fairly strong and those which continued to fail. It distinguishes the finished rolled products, which made their price peaks in the first half of the year, from those which were to make their peaks in the second half. Judging from

trade comment and the price quotations of independent steel producers, one can say that the demand of many industries for plate, bars, and shapes appears to have waned from this date, while that for sheets, wire, and pipe enjoyed a real and extended resurgence. It would be enlightening at this juncture if we could consult appropriate records of physical output, but there are few to help confirm these qualitative estimates of varying demand rates for the several classes of finished steel. Aggregate steel demand, it may first be noted, was such that total American ingot production remained at practically a constant level from May, 1920, through October. This condition may not reflect current demand so much as it testifies to the huge backlog of unfilled orders accumulated in the fourth and first quarters preceding. If we may rely upon a "derived" index of new orders received by the U.S. Steel Corporation,¹⁸ there seems to be substantial support for the latter condition. The index of new orders roughly describes a tall parabola between the months of May, 1919, and December, 1920, reaching its maximum in December, 1919, and January, 1920. Falling sharply to February, it recovers a few points hesitatingly in March, April, and May; and, after a poor showing in June and a good one in July, it continues its descent to the end of the year. The parabola thus roughly described does not fail by very much to coincide with new orders for fabricated structural steel, machine tools, and merchant pig iron. It is thus very likely that the high rate of steel operations through October, 1920, reflected an earlier demand. There is only one quantitative series which shows

¹⁸ It may be supposed that the rate of U.S. Steel operations fairly approximated that of its earnings, since no price changes were involved and the earnings figures are net before charges on capital obligations and deductions for depletion and depreciation. By prorating the total finished steel shipped by the corporation in 1920 (15,534,000 net tons) according to monthly earnings and by employing the monthly statements of unfilled orders, the new-orders series may be derived. The resulting series cannot be said to be perfectly accurate because the lack of shipping facilities in April, May, and June delayed the date at which the customer could be charged. Conversely, the shipping and charging of accumulated finished steel when freight again moved would appear as increased production. The behavior of the prorated production series, nevertheless, accords satisfactorily with scraps of external evidence, mainly that of market commentators whose practice it is to watch the Steel Corporation's operations very closely.

the rate at which other industries were consuming the various classes of rolled steel—and that one does so only partially. The National Association of Sheet and Tinplate Manufacturers, whose members, all independents, owned about 60 per cent of the American hot-sheet mill capacity, reported new orders, stocks, and production. Its production series climbed raggedly to a September, 1920, crest, then settled slightly during October and November before plunging downward by 80 per cent in the next two months. The prolonged rate of high output, held in spite of prices much above those of U.S. Steel, is sufficient evidence, however, to show the sustained demand for sheets.

Beyond the demand for sheets, it is a matter for speculation where the rest of the tonnage which maintained ingot production at its high level was originating. And this leads us back to U.S. Steel. If we may draw upon inferences from Steel's earnings statements, the "prorated" production series described in note 18 offers an interesting clue. U.S. Steel's production of finished steel suffered severely from the switchmen's strike; but from April through September its output rose steadily and dropped off only slightly in October. November and December, though lower, were nevertheless higher than April. This high rate, as we shall note shortly, was the object of considerable amazement and editorial comment, which contrasted it with that of the independents, attributing the phenomenon mainly to the wide price differentials. How great the contrast was can be estimated by subtracting the steel rolled by U.S. Steel from the total for the country. The remainder series, by months, reaches a peak in March, 1920, and falls off irregularly during the rest of the year. In solving the question of where the tonnage was originating, the answer is that the independents had lost much business to U.S. Steel and had received a continually diminishing volume of orders during the last three quarters of 1920. And, if we further subtract from their output the relatively brilliant record of the independent makers of sheets (sheets accounted for about 18 per cent of the total finished steel), the experience of the rest of the independent steelmakers after March, 1920, was particularly disheartening. If we are correct in our assumption that U.S. Steel earnings reveal

operations even fairly adequately, we are left with the obvious conclusion that the high rate of American ingot production was sustained by the large backlog accumulated by U.S. Steel in the first half, attracted by price advantages, in all classes of steel, amounting (in the case of sheet bar) to as much as \$50 per ton at one time.

The dividing-line referred to earlier as separating the various classes of steel products with respect to subsequent demand thus appears, in addition, to mark a point of divergence in the business fortunes of the independent steelmakers as compared with those of U.S. Steel Corporation units.

With the beginning of September the steel market became visibly weaker. The uncertainty over the consequences to steel prices of the authorized rail-rate increase, which had stalled trade during the latter half of August, was only partially clarified when the warehouses of the Steel Corporation and independents alike raised prices by the amount of freight increases. But no comprehensive announcement was made by the Steel Corporation, and most of the uncertainty persisted. Cancellations of automobile tonnages mounted precipitously in mid-August; but, surprisingly, this did not seem to have the depressing effect upon the steel men which might be expected, because they felt that any steel released by the auto trade would be readily absorbed by other classes of manufacturers which had been undersupplied.¹⁹ Nevertheless, cancellations were one of the true signals for the end of the boom. "Anxiety of consumers of iron and steel to place orders for shipment months ahead to protect themselves," said the *Iron Trade Review* in a very candid editorial, "gradually is passing and purchases are being regulated more . . . by specific wants."²⁰ Readjustments, plainly in evidence in other industries, it added, combined with the cancellations in iron and steel, were bringing credits into rigid scrutiny, all of which resulted in a smaller volume of buying. The editor again referred to the steelmakers' curious lack of concern at the prospect of a vanishing demand. The indifference was apparently real, however, because, in addition to

¹⁹ *ITR*, August 19, 1920, p. 485.

²⁰ *Ibid.*, September 2, 1920, p. 623.

the price increases by warehouses, Youngstown Sheet and Tube Company advanced its prices \$10 a ton. New business, nevertheless, continued to dwindle, and by mid-October was reported for the larger mills to be running 50-75 per cent of shipments. Buyers were indifferent alike to offers of prompt tonnage and to lower prices.²¹ The independents had already been making certain price concessions and expressed the willingness to drop their schedules to U.S. Steel Corporation levels were it not for their conviction that such action would not have any appreciable effect on volume. Furthermore, it was generally rumored that U.S. Steel itself would soon announce an over-all increase, effective January 1, 1921, equal to the advanced freight charges; and this possibility restrained any action on the part of the independents. Buyers likewise held off commitments for the U.S. Steel announcement, and trade reached dead center. It was not until November 19 that the announcement finally came from E. H. Gary. He reported that U.S. Steel prices were to remain the same, adding that "we think stability in business is of the highest importance and that every man is obligated to assist in stabilizing and maintaining prices on a fair and sane level."²² The pattern of thought which produced this informal essay is by no means clear, but it might be said to have received amplification when, in February, Judge Gary denied rumors that U.S. Steel was about to lower prices and added that lower quotations would not bring more business.²³

Before the November announcement, however, cancellations, which had become widespread in sheet steel with the collapse of the auto-materials market, had extended to wire. Even some units of the Steel Corporation, in spite of price differentials, were estimated to have received cancellations amounting to 20 per cent of liquid business in hand.²⁴ Upon the clarification of U.S. Steel's price policy, some of the independents immediately lowered their schedules to that level. By December 1 the independent mills generally had dropped to the Steel Corporation basis, and at the

²¹ *Ibid.*, October 21, 1920, p. 1103.

²³ *Ibid.*, February 17, 1921, p. 502.

²² *Ibid.*, November 25, 1920, p. 1460.

²⁴ *Ibid.*, November 18, 1920, p. 1377.

beginning of the holidays prices generally were at the levels established March 21, 1919. The exceptions were instances where the independents were beginning to cut under U.S. Steel.

In late December the iron and steel industry presented some unique contrasts. Independent steelmakers had all but ceased mill operations, while the U.S. Steel Corporation units were going at near-capacity rates! Carnegie Steel Company was producing at 95 per cent; Illinois Steel Company at 85 per cent; American Sheet and Tin Plate Company at 96 per cent. Earlier in December it had been estimated that new bookings of U.S. Steel were at the rate of 60 per cent of shipments; and at least 30-40 per cent of the output of heavy steel was going to farm-implement builders, railroad-equipment work, and to shipyards and navy requirements. On the other hand, market reporters found independent mills practically idle. Eastern plate mills as a group were closed for the first time since 1915, and wage reductions of 20-25 per cent were put into effect throughout the East. Independent sheet-makers were operating at about 35 per cent. The situation had not materially changed by late January, 1921. In the Mahoning Valley only 6 out of 51 independent open-hearth furnaces were in commission, and only 19 out of the 105 sheet mills. In contrast Carnegie and American Sheet mills were at about 92-95 per cent.²⁵ Just as in 1920, the independent mills had shaped their price and market policies purely in response to demand conditions, so they did in this crisis. In January, 1921, their prices were \$5.00-\$8.00 under those of U.S. Steel, and in late February this spread had grown to \$9.00-\$11.00. Whether steel demand is responsive to price, where the buyer has the real alternative of taking or not taking steel, cannot be settled here. What is fairly clear, however, is that if a buyer must have steel he will be influenced in his choice of maker by price considerations. Evidence drawn from U.S. Steel earnings and from market comments in the trade journals coincides very satisfactorily at this juncture. In March, 1921, 35 sheet mills in the Mahoning Valley started up, bringing the mills in that area from the 5 per cent at which they had been operating to 35 per cent of capacity. Meanwhile, the

²⁵ *Ibid.*, January 20, 1921, p. 189.

Illinois Steel Company, in mid-February at 85 per cent, was reduced to 65 per cent by February 23. Carnegie also showed about the same rate of operations. By March 2, U.S. Steel was said to be not over 50-60 per cent. By March 17, Carnegie was producing ingots at about 45 per cent of capacity, with the expectation of being reduced to 25 per cent in the near future. The independent companies, on the other hand, had been receiving sufficient business to lift their rates considerably during March. The expectation of price cuts by U.S. Steel was not much dampened by E. H. Gary's denial in February, and buyers held off, confidently awaiting the drop. According to the "derived" series, new orders fell almost to the vanishing-point in March, 1921, while the independents' production surpassed that of the Steel Corporation. Here was a curious reversal of the situation which existed in the fourth quarter of 1919 and the first quarter following. Then U.S. Steel had filled its books at relatively low prices, while the independents had filled theirs at whatever the traffic would bear. Now, however, U.S. Steel received practically no business at the old price, whereas the independents were attracting at lower prices whatever business there was in the market. As a result of the mounting pressure and in spite of Judge Gary's notions about stabilized business, U.S. Steel was forced to lower its prices to meet competition and did so on April 13. This action gave a fillip to steel prices all along the line in April and May; but the good effects were not long enduring, and prices resumed their down-drift, some of them to the third quarter in 1921, others into the first quarter of 1922. Tonnage volume, however, picked up in the third quarter of 1921, originating as the simple aggregate of the steel requirements of other industries. The behavior of these industries, as it affected the demand for certain classes of steel products, may be studied to better advantage individually, and we shall now turn to an analysis of the market factors which shaped the course of demand in the following classes of rolled-steel products: structural shapes, skelp, wire rods, sheets, bars, and plates. In connection with plates, we shall take the opportunity to look briefly at the demand arising from the machine-tool industry.

ROLLED-STEEL PRODUCTS

The *Census of Manufactures* recognizes sixteen classes of finished rolled-steel products, and these comprise nearly 95 per cent of the total tonnage. In order to show the relative importance of

TABLE 12
FINISHED ROLLED-STEEL PRODUCTS, 1919

	CENSUS OF MANUFACTURING		<i>Iron Age</i> (1922-26, AVERAGE PER CENT)
	Million Tons (2,240 Lbs.)	Per Cent	
Rails.....	2.089	8.2	8.9
Rail joints, fastenings, etc.....	0.463	1.8	2.3
Structural shapes.....	2.526	9.9	11.1
Bars for reinforced concrete.....	0.301	.....	2.3
Merchant bars, mill shaftings, etc.....	4.485	17.6	15.3
Bolt and nut rods, etc.....	0.233	.....	.....
Wire rods.....	2.645	10.4	9.1
Plates or sheets, other than for tinning.....	6.720	26.4	.....
Gauge No. 12 and thicker, 4.427 (plates).....	.....	[17.4]	12.2
Gauge No. 13 and thinner, 2.293 (sheets).....	.....	[9.0]	12.8
Black plates or sheets for tinning.....	1.084	4.3	5.0
Skelp.....	2.589	10.2	10.3
Hoops, bands, and cotton ties.....	0.832	3.3	1.7
Nail and tack plate.....	0.035	.....	.....
Axles, rolled or forged.....	0.098	.....	.....
Armor plate, gun forgings, and ordnance.....	0.101	.....	.....
Car and locomotive wheels.....	0.118	.....	.....
All other rolled or forged products.....	1.194	4.7	8.2
Total.....	25.513	96.8	.....

these products, the Census data for 1919 and the *Iron Age* estimate for the average of the years 1922-26 are given in Table 12.

Of particular interest is the exchange of places, relatively, between plates and sheets, which occurred during the period following 1919.²⁶ No small share of the responsibility for this change

²⁶ Although the Bureau of the Census makes a distinction between plates and sheets on the basis of thickness (*Census of Manufactures*, 1921, p. 400), this is not an entirely correct method of demarcation. According to the Carnegie Steel Company's handbook (*The Making, Shaping, and Treating of Steel* [Carnegie-Illinois Steel Corp., Pittsburgh, Pa. (1936)], pp. 923 ff.), the basis of differentiation is the degree of "finish" which the surface receives. The difference, that is, originates in

may be charged to the automotive industry, where demand has expressed itself not only in vastly increasing quantities but in progressively higher metallurgical specifications. It is also to be noted that only eight classes of products—i.e., rails and their accessories, structural shapes, merchant bars, wire rods, plates, sheets, and pipe—account for close to 90 per cent of the rolled tonnage.

The distribution of these products among the consuming industries, 1919-22, is not recorded. For later years fairly adequate mill reports enabled market analysts to arrive at a very detailed summary of the distribution. That for 1936 by *Iron Age*, for instance, lists the amount of each of twelve classes of steel taken by each of twenty-two industries. Early attempts were made, in lieu of adequate records, to estimate the over-all steel tonnages absorbed by the principal consumers. One such estimate is that presented by E. C. Kreutzberg, associate editor of the *Iron Trade Review*, early in 1922. His figures, given in Table 13, represent what he terms a "normal" consumption by the several industries and are expressed as percentages of the "normal" output of steel.²⁷ *Iron Age* likewise has made its own estimate of the amount of steel consumed by the leading buyers. Its estimates for 1922 and for the 1922-26 average, also given in Table 13, do not coincide in time with those of Mr. Kreutzberg, but they do, nevertheless, approach his very closely in proportional distribution.

The respective amounts of each class of steel which industries consumed (1919-22) is not, as mentioned above, recorded. Qualitatively it is known, however, what classes certain consumers typically require. Most of the steel requirements of the construction industry, for instance, are for shapes; those for shipbuilding for

the industrial use of the product, and this determines the method of manufacture. Users of plates are not urgently concerned with the finish. The utility of sheets, on the other hand, lies as much in their surface perfection as in their strength and ductility. Thus there is a substantial overlapping when judged by thickness or gauge: some sheets are thicker than some plates; the reverse is also true. The Census dividing-line is between gauges 12 and 13 (i.e., between $\frac{7}{8}$ inch and $\frac{8}{8}$ inch). But plates of $\frac{5}{8}$ inch can be rolled on light mills, and sheets made as heavy as $\frac{8}{8}$ inch. Number 3 gauge ($\frac{1}{4}$ inch) is a typical dimension of plates, while 28 gauge ($\frac{1}{4}$ inch) is typical for sheets.

²⁷ *ITR*, January 5, 1922, pp. 47-51.

plates, etc. The requirements of the automotive industry, on the other hand, are more diffused, centering on sheets and bars, in that order of volume. In Table 14 an attempt has been made to present these relationships. Opposite the class of steel is placed the industry which is its largest consumer.

It should be observed in connection with Table 14 that consumption refers to the amounts required for an industry's own product and not that used for building up its capital equipment.

TABLE 13
ESTIMATED DISTRIBUTION OF FINISHED STEEL

	Kreutzberg: Per Cent of Normal	<i>Iron Age</i> : Per Cent of 1922	<i>Iron Age</i> : Per Cent of 1922-26 Average
Building.....	14.23	15	17
Export.....	13.43	7	6
Automobile.....	9.82	10	12
Locomotives and cars.....	9.34	22	25
Railroad construction and maintenance..	7.79		
Oil, gas, and water.....	7.75	10	9
Machinery and tools.....	4.46	3 (1923)	3
Agricultural.....	3.59	4	4
Food-container.....	3.12	4	4
Shipbuilding.....	2.65	0	0
Not specified.....	23.71	(25)	20
	100.00	100	100

Thus the automotive industry, while requiring, in Kreutzberg's estimate, only 10 per cent of the country's steel for its cars, was certain to have used other vast quantities in connection with the rapid enlargement of plant capacity which took place following the war.

One is strongly tempted to venture guesses as to how much of each class of steel each industry absorbed; but for the period 1919-22 this is impossible. Were the situation otherwise, it could be determined roughly how large a part each industry played in shaping the market which surrounds each class. As it is, the student must rely upon qualitative appraisals and the substance of trade-journal comment. Nevertheless, under these rather unsatisfactory circumstances, some facts do emerge clearly. Whatever

the proportion of sheet production absorbed by the automobile manufactures, the latter do wield the major influence in that market. The origins of the bulk of rail and pipe business are clear—likewise of shapes. The market for plates is divided among several large consumers with the railroads leading. Oil drums and storage tanks must exert an influence in the plate market. The demand for bars arises most strongly from the automobile field, but machinery and implements are not far behind. Not shown by the

TABLE 14

1919 FINISHED-STEEL PRODUCTION			KREUTZBERG: NORMAL CONSUMPTION OF STEEL (ALL CLASSES) (PER CENT CONSUMED)
Per Cent of Total	Class of Steel	Industry	
10.....	Rails	Railroad: rails	8
10.....	Shapes	Building and construction	14
17.....	Plates	Ships	3
		Railroad: cars and locomotives	9
		Machinery, engines, and tools	4
18.....	Bars	Agricultural implements	4
13.....	Sheets	Automobile	10
10.....	Skelp	Container	3
10.....	Wire rods	Oil, gas, and water	8
		Export	13

estimates given above are the requirements of the nut, screw, and bolt firms, of the cable companies, and of farming—all of which draw upon the supply of wire rods. Similarly, no distribution figures for the steel of all classes taken by jobbers are available, although the products seeking outlet via that channel are large.

The point that each product is surrounded by its own market has been sufficiently pressed. It should not be supposed, however, that the several markets are wholly independent of common influences. A change in the demand for automobiles is relayed to several classes of steel, perhaps uniformly. But with respect to the steel requirements which might be associated with noncyclical and nonseasonal factors, such as that of growth, a temporary fluctua-

tion in demand may not be transferred uniformly. Finally, the temporal variation in the response of individual industries to expansive or depressive forces may, as well as growth factors, alter the amount of influence which any one of them currently wields in the market.

Closely associated with the element of individual industry responses to fluctuating tides of demand is another factor which is also intimately related to cyclical phenomena. It would appear that an index of physical activity of the principal steel-using industries, weighted according to the volume typically absorbed, would coincide with steel production. Such an index, prepared by Dr. Lewis H. Haney, was presented by *Iron Age* in 1926.²⁸ The composite curve for steel demand was described as "a weighted average of indexes covering railroads, building, automobiles, petroleum, exports, and farming—in that order of importance." The index itself, given in chart form only back through 1921, was graphed concurrently with ingot production and appeared regularly in the "Forecast Section" for a number of years. The two curves did not coincide, nor would they have done so if one index had been lagged by one, two, or more months. The difference, it is here suggested, may be attributed in no small part to the continually shifting appraisal which producers must of necessity make of the future. If the business of producing were conducted planlessly and on a hand-to-mouth buying basis, this disequilibrating factor would not be present. But one of the most characteristic elements in the alternating tides of business is the shortening and lengthening of the periods for which producers feel it wise to be "covered" on their raw-material requirements. This accordion-like period of forward commitments ranges from purchasing for needs based on bona fide orders to frantic importuning of producers for a place on the production schedule for delivery a year hence or "when possible." This view of matters is reinforced by the ever present element in the advices of business-forecasting services which relate to commodities. Even an expected downturn in the price of any material is in itself an implied warning to shorten commitments. Where the cost of materials is 50 per cent

²⁸ "Business Analysis and Forecast Section," *IA*, January 7, 1926, pp. 63-69.

larger than the value added by manufacture, as in 1919, changes in industrial buying behavior bring far-reaching consequences. These results are nowhere more effective than in steel. Thus, unless a long period of business stability had formalized buying habits, one would not expect an index of consumer activity to coincide with one of steel production.

With this short summary of the varying role played by steel users in the several steel markets, we may turn our attention to finished-steel products.

STRUCTURAL SHAPES AND THE BUILDING INDUSTRY

The use of shapes is limited to the construction industry. Heavy construction, such as bridges and industrial and commercial structures, absorbs practically all the fabricated structural steel. Typically, shapes are rolled in the steel mills and then shipped to the fabricators who prepare them for use in specific building projects. The existing records of the activity of the fabricators are those of the Bridge Builders and Structural Society. This association, having a membership of 234 firms and about 90 per cent of the capacity of the industry in 1922, has compiled reports on the ratio of new business to the plant capacity of its members.²⁹ No data on the actual rate of current operations are published for the period earlier than 1924.

New orders received by the fabricators fell to record low levels in the first quarter of 1919, from which they recovered sharply with but a temporary setback during the steel and coal strikes. The rise culminated in a high peak in February, 1920; and the drop which followed was precipitous, carrying business downward through one full year to the same levels reached in the early months of 1919. The upturn, beginning at the end of February, 1921, was as rapid and as extended as the decline. The behavior of new orders for fabricated structural steel coincides so closely with the value of industrial building contracts that very little in the way of differences is left to explain. Some questions may be legitimately raised, however, as to the apparently incongruous re-

²⁹ Bureau of the Census, *Record Book of Business Statistics*, Part II: *Metal and Machinery* (Washington, D.C., 1928), p. 33.

lationship between the demand for fabricated structural steel and the price of steel shapes.

The absence of records of current operations makes it almost impossible to guess how busy the fabricators were at any one time. But, since the rapid disappearance of new business set in during February, 1920, it is surprising that shape prices began their climb at the same time. On March 21, 1919, the steelmakers and the government set the price of shapes at 2.45 cents per pound. This level was held through January, 1920,³⁰ whereupon the agreement was broken by the independents, who ran the price up to 3.25 cents in April. In May they dropped to 3.10 cents and maintained this level until the prices of all steel products gave way in the closing months of the year.

There may be several partial explanations for the failure of prices to behave according to expected patterns. Over an eleven-year period centered on 1920, new orders per month averaged 61 per cent capacity, and the annual variation, excepting 1921, was not great. New orders booked in the last half of 1919 amounted to 77 per cent of capacity and those in the first half of 1920 to 72 per cent. This probably resulted in an expansion of the backlog of unfilled orders sufficient to hold operations at a satisfactory rate at least through August. Shipments during the first half of 1920 were estimated to have been at the rate of 61 per cent of capacity³¹ or just about average. On this basis the backlog must have grown during the first half by about two months' work at the average rate, and so the behavior of prices was not greatly out of accord with the rate of operations. It is also likely that the great winter buying wave, which resulted in a general clamor for positions on rolling-mill schedules, left the fabricators no choice but to compete with other buyers on a price basis or lose their tonnage to other industries.

³⁰ *Iron Age* and the Bureau of Labor Statistics do not agree on the price of shapes after January, 1920. *Iron Age* reports a steady rise to an April peak of 3.25 cents, after which the price holds, May through September, at 3.10 cents. The Bureau of Labor Statistics reports no price change before April, 1920, when shapes jump to 3.25 cents from a March level of 2.45 cents. They hold at 3.25 cents during May and June and then fall to 2.80 cents, at which level they remain, August through December.

³¹ *ITR*, July 22, 1920, p. 209.

BARS

Bar mills, historically called "merchant" mills (hence "merchant" bars), roll rods of relatively small diameters in a multitude of cross-section designs—for example, ovals, squares, tees, etc.—which are shipped in bundles ranging from a few feet up to more than 30 feet in length and weighing from 100 to 150 pounds. The most conspicuous users of bars are the auto- and parts-makers agricultural-implement and tractor manufacturers, machinery-makers and toolmakers, and the bolt and nut companies. In normal times a larger percentage of steel is rolled into bars than into any other class of products. Because of the nature of the product and the universality of its use, there are more merchant bar mills than any other sort.

Unlike sheet and plate mills, bar mills did not experience a great bulge in number during the steel boom of 1919 and 1920. The Census reported 145 mills operating in 1919, 10 of which were completed in that year and 6 building at the end of the year. Only 12 more were completed in 1920, 6 in process of construction at the year's end. In 1921 just 8 were finished, only 1 under construction on December 31.

The universal industrial use of merchant bars makes them a good index of over-all productive activity; but that very circumstance makes it impossible to ferret out the governing market influences at any given time. There are no series which report the rate of bar production, and we must, therefore, rely upon trade comment for light upon that subject.

In the price agreement of March, 1919, soft-steel bars were set at 2.35 cents a pound, a spread of 0.63 cents above the billets from which they are rolled. Following the upswing in industrial production during 1919, bar-rolling schedules were gradually filled. The desire to protect themselves against shortages arising out of the steel and coal strikes and freight-car restrictions led buyers in the closing months of 1919 to order far ahead of current needs.³² In December the scarcity of bars became acute, and orders were backed up into the third quarter of 1920. Prices for much of the tonnage had mounted meanwhile to 3.50 cents, as against the

³² Cf., e.g., *ibid.*, October 23, 1919, p. 1098.

U.S. Steel price, which was still at 2.35 cents.³³ In this connection we may note that the *Iron Age* index stood at 2.75 cents for December. While this index probably excluded U.S. Steel quotations after October, there remained, nevertheless, a wide variation in the real prices at which contracts were made.

Our propensity to generalize obscures more often than not the beginnings of price movements and, in a rapidly changing market, the extent of the disorganization of the market price structure. This befogging of the market picture would dull our perception, even if all transactions were immediate and on a cash basis. But in a market like steel, where rolling schedules may be in the making for seven months hence and where there is practically no steel to be found at once, company quotations become nominal and meaningless. It not only fails to be helpful but, indeed, becomes misleading if we are told that the median quotation is 2.75 cents, when the chances are ninety-five to five that no steel can be had under six months at that figure. An average of prices actually paid for spot steel would better disclose the real state of demand. Since we do not have such a series for steel, we must try not to miss the beginnings of important market developments while gazing too confidently at an index of price quotations. For instance, during December and January, 1920, when bar quotations were given as 2.75 cents, buyers "found it extremely difficult to get assured tonnage at any price,"³⁴ and big premiums were paid for early shipments. Thus the quotations which showed a temporary leveling-off in prices seemed to report a similar behavior in demand, whereas, in fact, buyers during those months reached a peak of feverish effort in their search for steel and were little concerned for prices.

Bar demand was sustained at a high level during the spring, and its relative scarcity during the traffic debacle brought prices in April to their meridian. Chicago bar-makers apportioned their remaining production for the second half. Makers in Philadelphia were sold for four to six months ahead, much of the tonnage being placed at 4.00 cents. Producers elsewhere were forced to with-

³³ *Ibid.*, December 11, 1919, pp. 1557 and 1566.

³⁴ *Ibid.*, January 15, 1920, p. 206.

draw bar offers. Traffic was crippling production to the extent that delivery went on a when-possible basis. Operations were throttled to 50 per cent in Pittsburgh and stopped entirely in the Mahoning district.

But early in May, with no discernible preliminary signs, new buying subsided and prices slipped. Bars originally ordered for Japan, but now canceled, were offered for resale. The market weakness, of course, was not confined to bars but extended through sheets, plates, shapes, and the entire range of finished and semifinished steel products. Some of these, as recorded earlier, recovered to make new peaks later. Bars, while showing a continual decline in price averages, nevertheless were not without good demand, though it was not uniform. The Illinois Steel Company, after being out of the market for months, now re-entered, but delivery was not promised.

There are scattered scraps of evidence which tell how the principal bar-buying industries were getting along. The Federal Reserve index of factory employment for the machinery group, 1919-22, includes foundry and machine shops, electrical machinery, machine tools, and agricultural implements.³⁵ Employment in this group of industries reached a crest in March, 1920, fell slightly through May, and made a near-peak in July, after which it tapered off, slowly at first but more rapidly as the year closed. The shipments of woodworking machinery rose steadily through 1919 and the first quarter of 1920. After the rail difficulties of April, it climbed sharply to a June peak. July and August were not much lower. October exceeded any month preceding June, but shipments fell off rapidly thereafter. Shipments of industrial pumps reached a crest in November, 1920. Employment in the production of agricultural implements in Ohio held at a fairly stable level throughout 1920 and into April, 1921, whence it toppled precipitously to the end of the year. It is not unlikely that production in Illinois followed approximately the same course, except that employment fell sharply in the beginning months of 1921. In the light of these statistics, however sketchy, it is clear that the productive activity of the principal bar-users persevered

³⁵ See p. 162, n. 37, below; cf. also *FRB*, June, 1934.

at a fairly healthy rate during the second half of 1920, excepting November and December. The edge of the market must have disappeared after July, although the upper limits of bar price variations remained the same at least into December. In October many bar-makers were still booked to the end of the year; and, though the buying was said to be lighter than in September, a very good month, cancellations also were lighter than among other steel products.

Recovery in bar prices, unlike those of sheets, was slow. Recovery in the productive activity of bar-users, also unlike that of automobiles in the case of sheets, was slow. The depression in agriculture effectively took the implement-makers out of the bar market. Employment in the machinery group did not turn upward until the end of 1921. Bar prices delayed until April, four months later.

PLATES

Universal and sheared plates range in thickness from $\frac{1}{4}$ to $2\frac{1}{2}$ inches, from 10 to 80 feet in length, and from 1 to 13 feet in width. These are the typical products of the plate mills. Jobbing mills make a light plate ranging from 3- to 12-gauge ($\frac{1}{4}$ — $\frac{7}{8}$ inch), from 8 to 20 feet in length, and from 3 to 6 feet in width. The principal users of plates are the heavy-goods industries. In the order of tonnage taken in 1919-22 they are: manufacturers of cars and locomotives, shipbuilding, fabricators for the construction industry, machinery and machine tools, and containers (tanks, barrels, drums, etc.). Exports account for an amount almost half that of railroad equipment.

The shipbuilding demand for plates (1919-22) did not grow out of sensitive economic responses to market conditions but rather out of what the government took to be the best interests of the nation. The extent of the abnormal shipbuilding activity in this period is best seen in historical perspective. The average annual gross tonnage completed in the following calendar years (in millions) was: 1918, 2.72; 1919, 4.25; 1920, 2.86; 1921, 1.39; 1922, 0.34. Over 2,300 keels were laid by the Emergency Fleet Corporation, and nearly 1,700 of these vessels were of steel construction. The average displacement or dead weight was 5,760 tons per ship.

In 1919 alone the United States Shipping Board consumed 2.5 million tons of steel, or 10 per cent of all the finished steel rolled that year! These figures are cited not for the purpose of recording the experience of the Shipping Board but to illuminate the background of the market for plates, of which probably one-third of the 1919 output went to the board.

Perhaps the best indicator of the rate of shipbuilding is not the tonnage building or completed, but employment. The number of men employed in shipyards in January, 1919, was 443,000. By November this number had fallen to 300,000.³⁶ In January, 1921, the number was 170,000, and by December it had shrunk to 56,000. It is not necessary to review the month-to-month employment variations in this case, because they are unimportant in comparison with the liquidation of an industry larger than the iron and steel industries combined. This gigantic enterprise, while noneconomic in origin, certainly made its economic weight felt. The beginning of 1919 saw the maximum shipbuilding activity, judged by employment. Thereafter building diminished at progressively increasing rates until the national program was finished.

Our next concern is with what in normal times is the largest consumer of plates, the car and locomotive manufacturers. And along with this group we shall also observe the activity of the railroad repair shops, whose steel consumption is about equal to that of the car-builders.

The disruption of the customary production activity of the car- and locomotive-makers after the war can be measured only by earlier comparisons. During the period 1912-18, when no trend was discernible, the average number of cars ordered annually was close to 133,000. In 1919 the number was 22,000; in 1920, 84,000; and in 1921, 23,000. Locomotive orders, the pre-armistice average of which was 2,700 a year, dropped to 214 in 1919, 2,000 in 1920, and 239 in 1921.

With this reduced scale of operations in mind, we may examine the course of railway-equipment demands as they relate to the plate market. We are not here concerned with the policies of the

³⁶ *Census of Manufactures, 1921.*

Railroad Administration, as such, or with the return of the management of the roads to the owners. It is entirely probable that the reduction in new-car orders may be attributed to the uncertainties associated with this transfer. There were, nevertheless, definite fluctuations in the rate at which new rolling stock was added; and it is the relationship between these, the traffic demands, and the plate market which we wish to consider.

The ton-miles of freight hauled is perhaps the most reliable index of the railroads' effective effort. In comparison with other production series this one fluctuated within comparatively narrow limits. Throughout 1919 and up to September, 1920, its course was generally upward. Notable reversals occurred in the last two months of 1919 and, of course, in April and May, 1920. The precise consequences of the outlaw strike as they affected specific industries are reported elsewhere in this study. The absolute extent of the rail paralysis does not readily show up in carloadings or other operating data. It is quite probable that, had rolling stock been available at the right places in sufficient quantities and had there been no coal strike and no general freight handlers' and switchmen's strike, a curve drawn considerably above that of actual ton-miles during the winter and spring months of 1920 would have described the service which would have accommodated the demand. In short, part of the "pinch" which manufacturers suffered on account of the railroad situation originated in an absolute reduction in service, and the other part originated in a relatively large bulge in demand for car service just at that period. It is practically a truism that the relative shortage of service was much greater than the absolute shortage—as measured by the drop in ton-miles. This view fits in also with what would otherwise be a curious element in the picture. Car shortages appeared in significant volume in July of 1919. From then on they mounted sixfold by the year's end and continued to ascend sharply through 1920 until the end of September. The greatest damage, the greatest drain on credit arising from goods stalled en route or unshipped, occurred during the second quarter and not when the absolute car shortage was at its maximum in September.

Although on a reduced scale, the railroads did respond to traffic

demands by ordering new equipment. A graph, reduced in amplitude, of freight cars ordered corresponds very neatly with any general index of production for the period under consideration. Locomotives show a similar pattern except that improvement lagged at the end of 1921. It is not precise to say that the railroad managements were doing all they could to meet traffic demands, because long-range policies and their effectuation were necessarily held up in this semi-interregnum. But the day-to-day practice of keeping equipment in as good condition as circumstances would permit seems to have continued unbroken. Employment in railroad repair shops rose steadily from early in 1919 through August and September, 1920. There is no way of measuring the rate of output of repair shops or the effects of labor practices. Nevertheless, it is safe to assume that repairs were not diminished during that time, at least. During the greatest pressure of service demand, when service shortages mounted to all-time peaks, cars were so desperately needed that they probably were not sent in on bad order as promptly as in normal times. Nevertheless, the number of cars on bad order averaged about the same in 1920 as in 1919, and both years were higher than 1918.

Before turning to the plate market itself, it may be well to consider another industry which, while not a consumer of steel in quantities anything like that of railroads, ships, exports, etc., nevertheless occupies a unique position among those which are great consumers—the machine-tool industry.

The machine-tool industry is relatively small. In 1919 the cost of its materials, principally steel and iron, was 56 millions, and only 56,000 men were employed.³⁷ The course of new orders for

³⁷ This industry is not to be confused with that classified by the Bureau of the Census as "machinery," the value of the products of which in 1919 surpassed \$4 billion. As a matter of fact, it is not appropriate to consider the manufacturers of 60 or more classes of machinery as diverse as windmills and hydraulic rams as integral units of a single industry; they should rather be taken as 60 industries. Unfortunately, no record of the monthly rate of output exists for the so-called machinery industry, which is by far the largest in the United States. The Bureau of Labor Statistics employment data which is used by the Federal Reserve Board in its index of factory employment includes, under the machinery class, foundry and machine shops, electrical machinery, machine tools, and agricultural implements. This group of industries shows an average of 804 thousand persons on the pay

machine tools is shown in Chart VIII (p. 173). With the disappearance of the demand which had originated in government war-work, toolmakers experienced a brief period of quiet. New orders improved in March, 1919, and employment followed in June. New business increased nearly fourfold up to January, 1920, whence it plunged downward by 94 per cent in the succeeding twenty months. Employment itself suffered a drop of almost 75 per cent in the same interval. Annual monthly averages of the quantity of tools shipped, such as shapers, milling machines, etc., show an interesting pattern. With 1913 equal to 100, shipments for 1917 were 172; those for 1918, 181; for 1919, 143; for 1920, 135; and for 1921 and 1922, only 20 and 26, respectively.³⁸ Obviously, the great jump in tool production was due both to the expansion of plant capacity and to the new tooling required for war products. In 1921 and 1922, on the other hand, the expanded plant capacities generally were not pressed. During the war the government itself was a large buyer of tools, many of which were disposed of subsequently. When the great rush of buying developed in the latter half of 1919, tool deliveries were lengthened and the government supplies helped to relieve the shortage. For instance, the Moline Plow Company purchased 250 machines from this source in September because delivery could not be obtained promptly elsewhere.

A special note might be prepared on the relationship between the growing automobile industry and the manufacture of tools. In January, 1920, the motor industry was at the crest of a cyclical upswing superimposed on a mushrooming growth curve; and forecasts of 20 million users by 1924, three times the current registration, seemed both credible and fantastic. Credible they were to manufacturers who were struggling to enlarge output. The willingness of automobile manufacturers to replace comparatively new tools with later designs, if even slightly greater output could

rolls in 1919. Most of the 60 classifications just referred to were, in the 1914 and earlier censuses, included under the foundry and machine-shop category. Hence this index of employment, while inadequate as to variations in output, is the best available indicator of the general health of the vast machinery group of industries.

³⁸ *Survey of Current Business*, April, 1924 (reports of a small but representative number of firms).

thus be obtained, was well-nigh proverbial.³⁹ Furthermore, according to good authority, practically every tool designed in the decade had been "influenced in some manner by prevailing practice in auto-production work." The quantity of new tools being placed in automotive service was enormous. In September, 1919, General Motors entered the market for \$2 \$3 million worth,⁴⁰ principally for the Flint factory, which was being made the largest of its kind in the country. Examples of this phenomenal expansion rate need not be given here⁴¹ in order to indicate the prodigious demand for tools originating in the automobile industry. A survey published by the editors of the *Iron Trade Review*⁴² showed that approximately 60 per cent of the output of sixteen representative tool manufacturers was going to the automotive trade. Machinery dealers, too, felt the impact of the motor demand, the report disclosing that an average of 70 per cent of the business of eight typical firms originated with the automobile-makers.

From fall, 1919, through the following spring, large tool demands also came from the textile machine-makers and electrical-goods manufacturers, principally the General Electric Company, in the East. At the end of April, however, not only had new business vanished but cancellations had begun to appear. In order to hold such disturbances at minimum levels, tool representatives visited buyers in May and June, asking them to affirm the "exact status of orders" which they had placed for tools. When cancellations began to be received, even though small in number, sellers were not perturbed, as one might expect them to have been. The explanation of this, true also in other industries which we have observed, is that tools released by one cancellation could readily find another buyer because of the attractiveness of near-delivery promises. Thus it takes some time for a sellers' market to change after the rate of new business has declined and even after cancellations themselves have set in.

But by the middle of June no one could mistake the tenor of the

³⁹ *ITR*, January 1, 1920, pp. 55-56.

⁴¹ See chap. vi, "Automobiles."

⁴⁰ *Ibid.*, September 11, 1919, p. 753.

⁴² January 1, 1920, pp. 55-56.

tool market. One aspect of the contraction is worth noting, and it may best be described in the words used by a market observer at the time:

This shift of the market has been brought about by several factors, chief among which has been the tightening of credits. Many manufacturers who planned additions or expansions of capacity have been unable to finance such projects but have continued to receive estimates on probable equipment costs. They state, however, that they have postponed their purchases indefinitely.⁴³

There are no separable employment figures for the machine-tool industry for 1920. But the index of employment in the machinery group, described earlier, declined steadily after July, and it is not improbable that machine-tool-factory employment followed a similar course. Improvement in the tool business lagged behind that of its principal customers, since the latter needed no larger productive capacity until their volume had again risen above average.

We may now return to the plate market itself. In the March, 1919, agreement, ordinary $\frac{1}{4}$ -inch tank plates were set at 2.65 cents a pound. This rate is probably representative, but interesting exceptions are to be found. In July of that year the government awarded contracts for 50,000 tons of armor plate at \$520 a ton, or 26 cents a pound. In view of the greatly reduced volume of railroad-equipment buying and a high, though falling, rate of ship construction, plate prices were not strong during 1919. It was not until steel products generally became scarce, relative to the universal rush of buyers to obtain them at any cost in the spring of 1920, that prices responded. It is entirely possible that, if no substantial demand at all had arisen for plates, prices would have lifted anyway because of the alternate use to which the steel could be put, the major difference between plate and sheet bar lying principally in the rolling. As a matter of fact, plate prices ascended relatively less far than either sheet bar or billets, and this difference must have been due at least partially to the unused or unpledged capacity of the plate mills which would have suffered considerably expense in changing over. Demand, however,

⁴³ *ITR*, July 1, 1920, p. 2.

was substantial; and, although prices lagged behind other products, rolling schedules, seriously interrupted during the rail tie-up, were still supplied with orders as late as July and August 1920. But by the end of August prompt plate deliveries were offered, thus indicating an early appearance of uncovered schedules. These offers may have resulted from the fairly large cancellations of ship material, including one lot of 25,000 tons and another, ordered by Japan, of 11,000. The cancellations of Japanese orders for all steel were thought to have totaled close to 300,000 tons. Much of this was offset by the re-entry of Germany into the plate market; nevertheless, the swift disappearance of new buying for ship and railroad accounts at the end of the second quarter (1920) withdraw the market support and prices entered upon their long descent. By the end of the year prices were back to the stabilized level of 2.65 cents, and plate mills as a group were operating at extremely low rates, eastern mills being shut down for the first time since 1915. The depression in plates was long-lived. Ship-building all but ceased in 1921. The railroads had progressively cut their purchases as business indices turned downward, and it was not until the fourth quarter in 1921 that buying was resumed. The builders of machinery, judged by employment figures, were similarly inactive, their recovery dating six or seven months behind the general manufacturing activity of the country.

WIRE RODS

In 1919 rolling mills produced 2,645,000 tons of wire rods which were drawn into steel and iron wire, 63 per cent of it by the 24 wire departments connected with steelworks and rolling mills and the balance by 49 outside wire mills. After being further fabricated, principally in the plants where drawn, the wire was distributed approximately as follows: staples, barbed and woven wire, mainly for farm use, 27 per cent; nails, 24 per cent; cable, 4 per cent; plain and galvanized wire, 39 per cent.

The market for wire products is essentially twofold: that for nails and that for wire in various forms. The price-stabilization agreement of March, 1919, set wire rods at \$52 per ton (2.32 cents per pound), plain wire at 3.00 cents, and wire nails at \$3.25 per

100-pound keg. Wire rods, in concert with other finished-steel products, responded to insistent demand by breaking away from the set price in late October and rising steadily to \$75 in June, 1920—a level which it preserved until the year-end collapse in steel prices.

For wire products, generally, books were being closed and deliveries lengthened as early as July, 1919. There are no indices which might give a satisfactory clue to the course of demand for wire—at least from the point of view of the users. The rate at which farm requirements are fulfilled is probably not so responsive as that of industrial users. The index of all prices received for farm products did not begin to recede until June, 1920,⁴⁴ although meat animals had reacted just a year earlier, while grain and cotton indices reached their peaks in June, 1920. The price of plain wire mounted irregularly to 3.75 cents before beginning a fifteen-month descent in November, 1920; and there is no reason for supposing that wire in a further stage of fabrication for farm use behaved dissimilarly. Thus the gap in time between the downturns of farm and wire prices, occurring as it did during the off-season of fence-building and repairing, might be accounted for by the lack of immediate responsiveness of the farm demand to changes in the prices received by farmers for their products.

The industrial uses of plain and galvanized wire are too manifold to generalize. Demand evidently caved in toward the close of 1920, for there are records of fairly heavy cancellations during November, even in the American Steel and Wire Company, where prices, at the stabilized level, had been far below the independents' throughout the year.⁴⁵

Wire-nail prices present a rather curious pattern. They followed the upward curve of building and construction during the last half of 1919 and first month or two of 1920. At the end of February the independent nail manufacturers lifted the price to \$4.00, their new cards, with new extras, "superseding the card of

⁴⁴ Bureau of Agricultural Economics, "Index Numbers of Prices Received by Farmers for Farm Products, 1910-1935" (Washington, 1935). Pp. 722. (Mimeographed.)

⁴⁵ *ITR*, November 25, 1920, p. 1445.

December 1, 1896."⁴⁶ This action appears to have been a new attempt at price-fixing to halt the runaway nail prices, for they settled back from \$4.50 to the new level just as the building boom collapsed and maintained that level until August, when they were again advanced, this time to \$4.25 to offset the new freight rate. Nail prices, up until January, 1920, had advanced far out of line with rods. In March, after being reduced, they were relatively under rod prices, the latter having meanwhile ascended rapidly. With the August rise the percentage gap was merely shortened somewhat. The price drop of each between October and the end of the year was relatively equal. In summary it is entirely probable that nail prices for 1919 through February, 1920, responded to demand conditions and between the latter date and the final downturn represented an attempt on the part of producers to bring quotations more in line with the cost of rods.

SKELP AND THE PETROLEUM INDUSTRY

Skelp is rolled in plates suitable for bending into tubular forms for pipe. In 1919, 85 per cent of the skelp rolled in the steel mills was transferred by them to their own pipemaking departments. Over 43 per cent of the pipe in that year was classified by the Census as "casing, tubing, drain and line pipe for production and transportation of oil and gas, and for other drilled wells"⁴⁷ and was generally referred to by the trade as "oil-country goods." Since our interest lies in market considerations, it is pertinent to record that, of the 38 steelworks rolling skelp, only 10 establishments were reported as making oil-country goods in 1919 and 1921. To these 10 must be added an unknown number of the 50 establishments, not connected with rolling mills, which accounted for nearly one-quarter of the total production of all kinds of pipe. The number of makers of oil pipe in this group was probably less than 10, and these were, in all probability, very small establishments. It is fair to guess that four-fifths of the oil-goods market was held by the 10 major establishments.

The story of the market surrounding skelp is found in the vast expansion of oil production during the war and the decade which

⁴⁶ *Ibid.*, January 6, 1921, p. 89.

⁴⁷ *Census of Manufactures, 1921*, p. 390.

followed. The consumption of crude petroleum by refiners more than doubled between 1917 and 1924, with scarcely an interruption in the rate of growth in 1921. Domestic use of gasoline increased rapidly during 1919-22, the consumption rate in mid-1922 tripling that of the first quarter of 1919. This great upward surge in the public demand for motor transportation produced inevitable repercussions in the oil fields. The work of finding and developing new fields, of carrying oil to transmission points, and of laying lines to refineries required more pipe than could be found immediately. By mid-July, 1919, the *Iron Trade Review* reported that "lapweld pipe orders for several hundred miles are still seeking manufacturers."⁴⁸ Delivery dates were lengthening, and prices became of secondary importance.

The price of skelp was stabilized at 2.45 cents per pound in the spring of 1919 and, according to *Metal Statistics*, remained at that level through January, 1920,⁴⁹ although one manufacturer, at least, raised his prices \$5-\$10 a ton as early as July, 1919. By June, 1920, the independents were quoting prices at a peak of 3.50 cents, \$21 per ton above National Tube figures. From July through October, skelp was held at the slightly lower level of 3.25 cents.

On the demand side it is difficult to find good reasons for the decline in skelp prices which began in November, 1920, and continued without interruption to March, 1922, cumulating a drop of \$37 a ton. By the end of 1919, mills were sold through 1920.⁵⁰ The work of bringing wells into production increased throughout 1920 and the first two months of 1921. The production of crude petroleum climbed evenly through May of that year. Thus there does not seem to have been a diminution in the rate of new oil-pipe requirements until several months after skelp prices gave way.

SHEETS AND THE AUTOMOTIVE INDUSTRY

By far the largest factor in the market for steel sheets (1919-22) was the automotive industry. Fortunately, through the efforts of the National Association of Sheet and Tin Plate Manufacturers,

⁴⁸ July 17, 1919, p. 149.

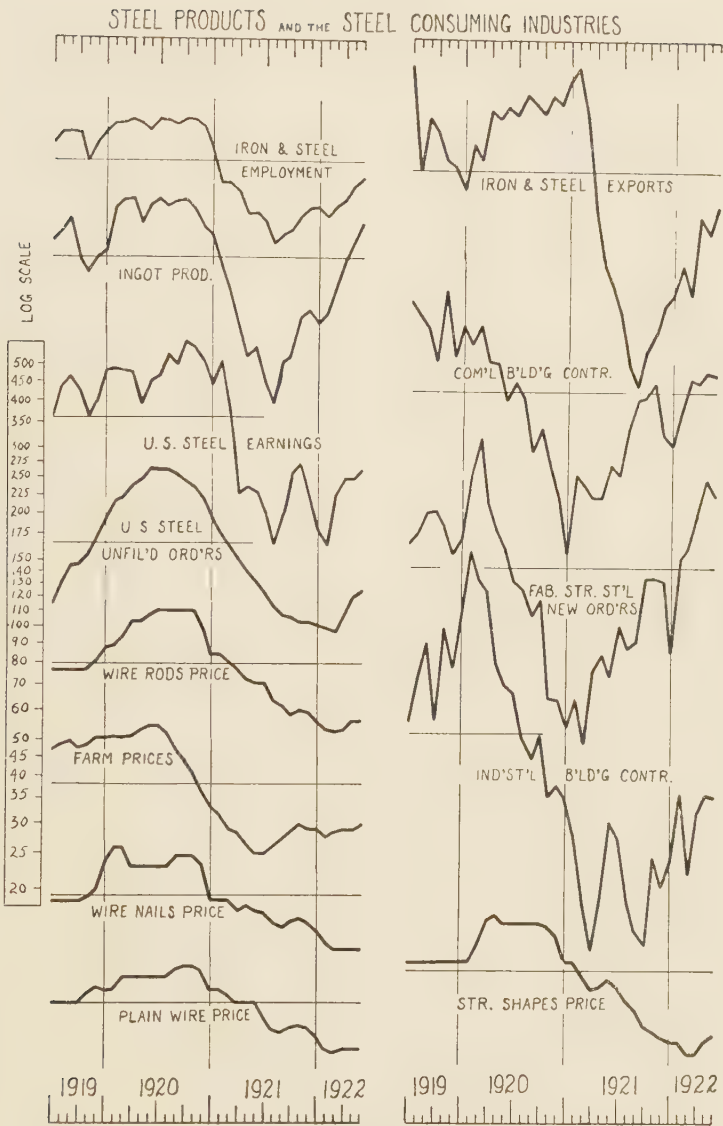
⁴⁹ American Metal Market, *Metal Statistics*, 1923, p. 129.

⁵⁰ *ITR*, December 25, 1919, p. 1685.

STEEL PRODUCTS AND THE STEEL-CONSUMING INDUSTRIES

Iron and steel; factory employment in steel works and rolling mills, cast-iron-pipe mills, and structural-iron works. Adjusted for seasonal. Federal Reserve Board.	Iron and steel, exports, tons. Not adjusted for seasonal. U.S. Bureau of Foreign and Domestic commerce.
Steel-ingot production. Federal Reserve index of production, daily average. Adjusted for seasonal.	
U.S. Steel Corporation, net earnings.	Building contracts awarded, commercial (square feet of floor space, 27 states). Adjusted for seasonal. F. W. Dodge Corporation.
U.S. Steel Corporation, unfilled orders, end of month. Adjusted for seasonal. U.S. Steel Corporation.	Fabricated structural steel, new orders. Adjusted for seasonal. U.S. Department of Commerce and the Bridge Builders and Structural Society.
Wire rods, open hearth, and Bessemer. <i>Iron Age</i> , average of prices at Pittsburgh.	
Farm prices, U.S. Department of Agriculture index of all groups combined. Not adjusted for seasonal.	Building contracts awarded, industrial (value, 27 states). Adjusted for seasonal. F. W. Dodge Corporation.
Wire nails. <i>Iron Age</i> , average of prices at Pittsburgh.	
Plain wire, base. <i>Iron Age</i> , average of prices at Pittsburgh.	Structural shapes. <i>Iron Age</i> , average of prices at Pittsburgh.

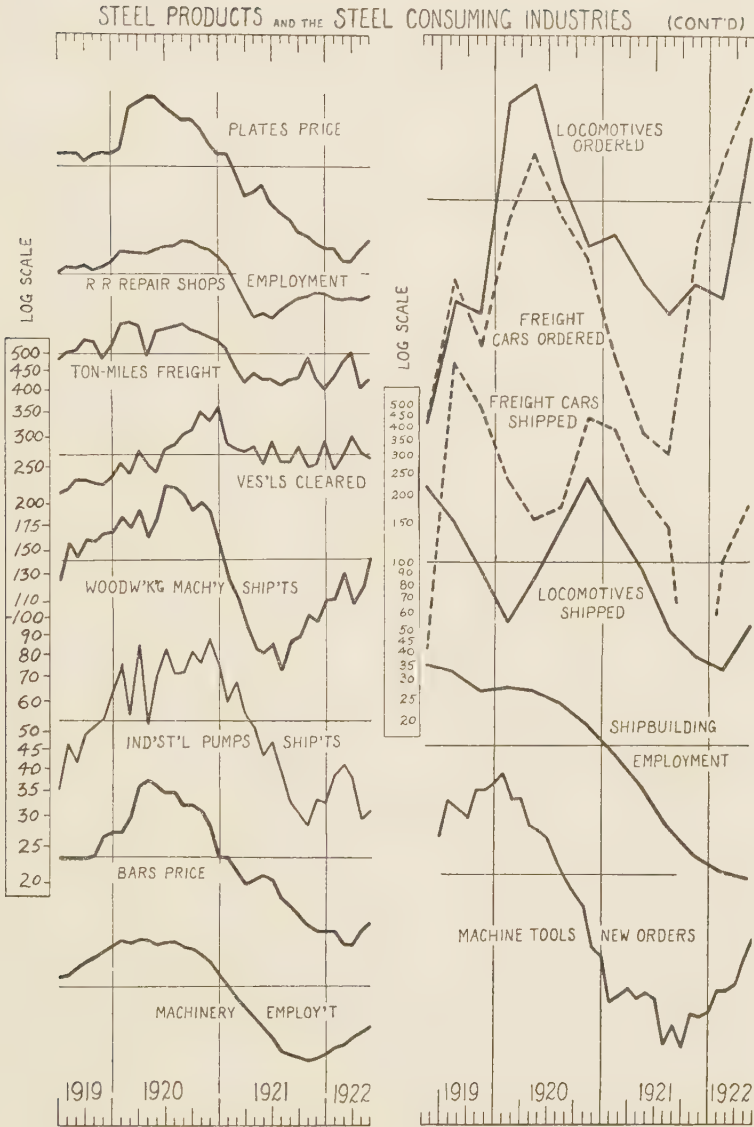
CHART VII



STEEL PRODUCTS AND THE STEEL-CONSUMING INDUSTRIES—*Continued*

- | | |
|--|---|
| Plates, $\frac{3}{4}$ -inch tank. <i>Iron Age</i> , average of prices at Pittsburgh. | Railroad locomotives, domestic, ordered by railroads. Not adjusted for seasonal. John Partington, <i>Railroad Purchasing and the Business Cycle</i> , pp. 219-26. |
| Railroad repair shops, employment. Adjusted for seasonal. Federal Reserve Board. | Freight cars, domestic, ordered by railroads. Not adjusted for seasonal. <i>Iron Trade Review</i> . |
| Ton-miles of freight hauled; revenue and nonrevenue; Class I, steam roads. Adjusted for seasonal. Bureau of Railway Economics. | Freight cars, domestic, shipments. Adjusted for seasonal. Interstate Commerce Commission. |
| Vessels cleared in foreign trade, net tons. Adjusted for seasonal. U.S. Bureau of Foreign and Domestic Commerce. | Railroad locomotives, domestic shipments. Not adjusted for seasonal. U.S. Railroad Administration, 1919; thereafter, Bureau of the Census. |
| Woodworking machinery, value, shipments. Adjusted for seasonal. Association of Manufacturers of Wood Working Machinery. | Shipbuilding, employment. Adjusted for seasonal. Federal Reserve Board. |
| Industrial pumps, value, shipments. Adjusted for seasonal. Hydraulic Society. | |
| Soft-steel merchant bars. <i>Iron Age</i> , average of prices at Pittsburgh. | Machine tools, number, index of new orders. Not adjusted for seasonal. National Machine Tool Builders' Association. |
| Machinery, factory employment. Adjusted for seasonal. Federal Reserve Board. | |

CHART VIII



we have records reporting production of 60 per cent of the sheet-mill capacity of the United States. The 40 per cent not in the Association is comprised of U.S. Steel and a few scattered establishments. Price reports, while covering a wide field, are not so extensive as could be wished. But it is possible to trace fairly adequately the reaction of sheets to changing market conditions.

In the agreement of March 21, sheet bar was set at \$42 a ton (1.875 cents a pound), No. 10 hot-rolled sheets at 3.55 cents, No. 28 hot-rolled sheets at 4.35 cents, No. 28 galvanized sheets at 5.70 cents, and tin plate at \$7.00 a base box, Pittsburgh. At the beginning of the second quarter (1919), the demand for sheets improved. By June, orders were double those of May, and in July makers reported that they had on their books all the business that they could take care of in the third quarter. In Pittsburgh alone orders were coming in at the rate of nearly 20,000 tons daily (the 1919-20 daily average would be approximately 5,700 tons), much of it, it was noted, business which should have been placed in the second quarter.⁵¹ In August, 15 of the 23 cold-finished sheet-makers began quoting on a new higher-price basis; and with this action probably the first breach in the price structure agreed upon in March took place. It is not strange that the break occurred in the material peculiarly needed by the automotive industry. The finish required by body materials can be provided only by the cold-rolling processes which follow hot rolling. Unfortunately, there is no price series earlier than 1921 for this class of sheets,⁵² but there are isolated references to its current price to which we shall refer shortly. Automobile-production rates almost doubled between January and December, 1919, and the consequent demand upon the sheet-makers was insistent. Some notion of the regard in which makers held the strength of the new automotive demand may be inferred from the rate of construction of new cold-mill capacity. One mill was completed in 1919; 18 were

⁵¹ *Ibid.*, July 10, 1919, p. 79.

⁵² *Iron Age* began a series of quotations on automobile body and light cold-rolled sheets, No. 22 gauge in January, 1921. The average monthly price for this class of steel for 1921 was 4.83 cents compared with 3.50 cents for No. 28 hot-rolled annealed sheets—a difference of 1.35 cents per pound.

building at the year's close. But in 1920, 87 mills were completed, and 48 were building at the end of the year. Even the conventional hot-rolling mills experienced a great bulge in capacity, for 22 were completed in 1919 while 83 were building December 31. These were completed in 1920, and 101 were under construction at the year's end.

As early as September, mills were being importuned to cover the sheet requirements of their large customers for the first quarter of 1920, but without effect.⁵³ Mills were uncertain about what prices would be and about the availability of sheet bar, which was then becoming scarce. The acuteness of the shortage in sheets as well as sheet bars was heightened by the steel strike which induced inordinate demands upon warehouse supplies. The automobile-makers, in particular, scoured the market for sheets and picked up everything in jobbers' stocks.⁵⁴ The records of the sheet-makers accurately reveal the extent of the shortage. Unsold stocks,⁵⁵ which, on the average, amount to about four days' rolling, plummeted to near zero. Stocks which are piled usually average about fifteen days' rolling, and these sank to five days' supply at the end of October. In all probability, week-to-week records would have shown stocks at an even lower level in mid-month.

Contracting supplies were further reduced when a number of mills were again forced to close in December as a result of the coal strike. Backlogs accumulated, and delivery dates became meaningless. Unfilled orders at the turn of the year were the equivalent of nine months of rolling at the 1919 rate. Spring of 1920 brought greatly increased buying, accompanied by growing fuel and transportation difficulties. At the height of the buying wave highly finished sheets for the automobile trade skyrocketed to 15 cents per pound! How critical the shortage in this class had become may be judged by noting that plain black sheets, hot-rolled No. 28, were being quoted at 4.35 cents by the American Sheet and Tin Plate Company and at around 5.50 cents by the independents.

⁵³ *IA*, September 18, 1919, p. 798.

⁵⁴ *Ibid.*, October 2, 1919, p. 943.

⁵⁵ Because of its amplitude the graph of this series has not been included among those relating to steel.

Sheet bars for this class of sheets were pushed up to \$90 a ton as compared with the agreed price, maintained by U.S. Steel, of \$42.⁵⁶ It is not perfectly clear when the buying crest was reached, but it is probable that it terminated at the end of April. The motor manufacturers were particularly hard hit, on the materials side, by the freight paralysis; and they were not likely to balk at the price of materials, which amounted to less than \$100 on a \$2,000-\$3,000 car,⁵⁷ if they could only get delivery. Their buying had apparently subsided by May 4, however, because black sheets which had been bringing 10-11 cents a week earlier in Detroit could not then find takers at 8.50 cents. Similarly, sheet bar had dropped to \$75 from \$80.⁵⁸ It is curious that this break in prices should occur simultaneously with a definite curtailment in sheet production caused by the traffic situation. The American Sheet and Tin Plate Company was down to as low as 12-15 per cent of capacity at the outset of May; and the loss of production among the whole sheet industry was admittedly a large factor in the market. It is possible that the reversal in automobile sheets had its origins on the car manufacturers' side rather than in any changed conditions in the supply of sheets. In apparent confirmation of this view is the fact that not two weeks later the first suspension of orders for automobile parts appeared at Cleveland.⁵⁹

Here, again, is a contrast in steel prices. Sheets for the automobile trade came into progressively critical demand throughout 1919 and forced sheet-bar prices far out of line with sheet-bar products. After the "pinch" in the latter half of April, automobile sheets, while not effectively out of demand, offered less pressure. The action had taken sheet bars upward at a rate 40 per cent in excess of ordinary black, No. 28 hot-rolled sheets. After the crest of automobile buying had passed, sheet bar receded. By contrast, No. 28 sheets, which had risen "in line" with bar to March, 1920, moved horizontally from that date through June. Then, as bar fell off, No. 28 sheets rose sharply through July and August. Two

⁵⁶ *ITR*, October 7, 1920, p. 965; see also January 6, 1921, pp. 46 ff.

⁵⁷ *Ibid.*, January 6, 1921.

⁵⁸ *Ibid.*, May 6, 1920, p. 1311.

⁵⁹ *Ibid.*, May 13, 1920, p. 1373.

or three factors may be held accountable for this contramovement. The July-August rise in sheets brought them exactly "into line" with sheet-bar prices. The relatively low production and high rate of new business had brought backlogs to all-time peaks by July, 1920, and there was no reason why the small available tonnages on rolling-mill schedules should not be booked at prices in accord with sheet-bar costs. Freight congestion and the Interstate Commerce Commission car-service orders restricting the supply of cars available for the sheet-makers continued to interfere seriously with the distribution of sheets, thus tending to increase the premium on near-by deliveries. Early in July the American Sheet and Tin Plate Company was reported to have 32,000 tons of sheets piled and awaiting transportation, and it was not until mid-August that the traffic situation ceased to be a major market factor in the sheet industry.

Although the lively bidding among the automobile manufacturers for sheets subsided in the first week of May and some suspension of orders appeared as early as the middle of that month, it was not until the beginning of July that specifications from the Detroit area began to fall off in significant quantities. But in August the automobile demand gave way in earnest, and cancellations by the end of the month constituted the largest single factor in the market. Curiously, however, this did not seem to impress the steel men as calamitous. As pointed out in an earlier section, order-books were full, and any tonnage released by the automobile manufacturers was expected to be absorbed by other groups. This attitude was not without apparent support, for early in September a large consumer of sheets sent inquiries for large tonnages to fifty-two sources, and practically all the replies stated that on account of heavy bookings the makers "were not in a position to consider additional business."⁶⁰ Also the confidence of steel men in the market outlook was probably not diminished by the action of the Youngstown Sheet and Tube Company in boosting sheet prices \$10 a ton on August 25. Yet the tide of business surely was on the ebb. The volume of new orders disappeared after the middle of July at an increasing rate. In the next forty-five days the

⁶⁰ *Ibid.*, September 9, 1920, p. 695.

deterioration progressed in rapid stages through the delay of specifications and finally to outright cancellation of orders. The state of the automotive market may be judged by the announcement on September 21 of the reduction in the price of Ford cars from \$575 to \$440 (electric starter, \$70 extra). "We must take a temporary loss," said Mr. Ford, "by reason of having stocks and materials on hand bought at inflated prices."⁶¹ Sheet prices sagged in every market at the end of September, and a canvass of the trade by makers in October failed to bring in added business at lower prices.⁶²

With new business almost at the vanishing-point and prices caving in, sheet-makers worked off the load of unfilled orders. These were reduced from 813,000 tons at the beginning of August to 313,000 tons at the end of December, not quite two months' rolling at the 1920 rate. As in all lines of steel products, the independents finished the year with activity almost at dead center, while the operations of the U.S. Steel Corporation were at near-capacity rates. January, 1921, showed American Sheet and Tin Plate at 92 per cent and Carnegie at 93 per cent, whereas only nineteen of the one hundred and five independent sheet-makers in the Mahoning Valley were operating at all.

The short-lived depression in the automobile market reached its nadir in January, 1921. Recovery was sharp, and production reached the 1919-22 average by June of the same year. Sheet production described an identical course, failing, however, to return to quite the same relative levels by June. The upsweep carried the rate of production to a point equal to that of 1920's best by May, 1922, and was interrupted by only two temporary reversals. This action was the more interesting for having occurred while sheet prices were falling. The degree to which we have been able to explain price variations between March, 1919, and January, 1921, as responses to rapidly altering demand conditions or to attempts on the part of the producers to bring certain products into line with material costs must be the measure of our embarrassment in the

⁶¹ *Automotive Industries*, September 23, 1920, p. 636.

⁶² *ITR*, October 21, 1920, p. 1181.

relationship between demand and prices following January, 1921. There appears no escape from the paradox except to seek refuge behind the assumption that the post-war demand for goods was still unsatiated (especially as regards automobiles) and that, coinciding with a reduction in costs, the demand curve had also become more elastic.

In April, 1921, the U.S. Steel Corporation lowered its prices to those of the independents and followed the policy thereafter of meeting competition on a price basis. Again a wide difference in the rate of operations appeared. At the end of November the American Sheet and Tin Plate Company was producing at the rate of 83 per cent, while the members of the association averaged only 51.2 per cent.

A concluding note on the general behavior of prices in the several markets for individual steel products may be appropriate.

Like water, steel ingots may be directed to many uses. Aside from metallurgical specifications, the form in which steel emerges from the mills depends upon the rolling or shaping it receives. The only obstacle preventing a perfect fluidity among uses is that there are differences in the rolling equipment for the several classes of products, and a mill may be put to a considerable, even prohibitive, expense in changing over from one product to another. Thus, while demand is strong in a sufficient number of rolled products to keep ingot production at a high rate, prices might not descend in those products where demand has fallen, even though idle capacity appears in the latter, simply because of the alternative uses to which the ingots may be directed. In addition, the prices of products which have fallen out of demand may actually be raised if the semifinished steel of which they are rolled becomes the object of intense demand from other quarters. These circumstances were observed in operation between April and October, 1920. Conversely, when the total demand for steel is falling, as was the case in the first half of 1921, an increase in the demand for a given product (e.g., sheets) scarcely affects its price.

STEEL PRODUCTS AND THE STEEL-CONSUMING INDUSTRIES—*Continued*

Grooved-steel skelp. American Metal Market, average of prices at Pittsburgh.

Petroleum wells completed. Appalachian fields. Adjusted for seasonal. U.S. Bureau of Mines.

Petroleum products: gas and fuel oil, lubricating oil, kerosene, gasoline; average of weekly prices weighted by 1919 values of goods produced.

Crude petroleum, production. Adjusted for seasonal. U.S. Geological Survey.

Gasoline, refinery production. Adjusted for seasonal. U.S. Bureau of Mines.

Gasoline, refined stocks, end of month. Adjusted for seasonal. U.S. Bureau of Mines.

Gasoline, refined, domestic consumption. Adjusted for seasonal. U.S. Bureau of Mines.

Gasoline, motor. U.S. Bureau of Labor Statistics, average of tank-wagon prices, New York City.

Steel sheets, stocks, end of month. Adjusted for seasonal. National Association of Sheet and Tin Plate Manufacturers.

Steel sheets, black, blue, galvanized, and full-finished, production. Adjusted for seasonal. National Association of Sheet and Tin Plate Manufacturers.

Automobiles, production. Federal Reserve index of factory sales of passenger cars, taxicabs, and trucks. Adjusted for seasonal.

Automobiles, factory employment. Adjusted for seasonal. Federal Reserve Board.

Steel sheets, new orders. Adjusted for seasonal. National Association of Sheet and Tin Plate Manufacturers.

Automobile accessories and parts, sales to dealers. Adjusted for seasonal. U.S. Department of Commerce.

Open-hearth steel billets. *Iron Age*, average of prices at Pittsburgh.

Sheet bar, open-hearth. American Metal Market, average of prices at Pittsburgh.

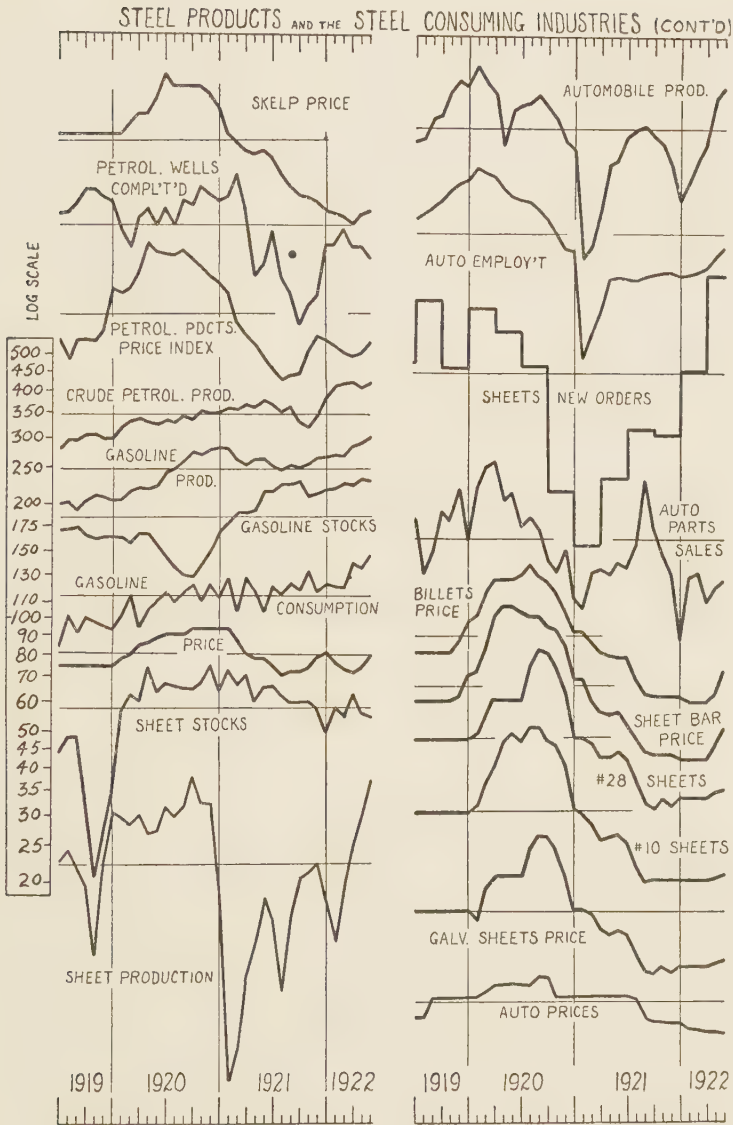
Hot-rolled annealed sheets, No. 28 gauge. *Iron Age*, average of prices at Pittsburgh.

Hot-rolled blue annealed sheets, No. 10 gauge. American Metal Market, average of prices at Pittsburgh.

Galvanized sheets, No. 28 gauge. *Iron Age*, average of prices at Pittsburgh.

Automobiles. U.S. Bureau of Labor Statistics, index of wholesale prices.

CHART IX



IRON

The production of iron, of course, follows that of steel, inasmuch as 78 per cent of the total iron in 1919 was consumed by steelworks and rolling mills. But in spite of this fact, there is a very interesting market for iron which may be better understood by a brief tabulation of the disposition of iron in 1919 (Table 15).

On the supply side of the market an interesting situation appears. Seventy-one per cent of the iron was made in plants which produced for their own consumption. In this group there were only 89 establishments, averaging 243,300 tons each. In contrast,

TABLE 15*
DISTRIBUTION OF IRON IN 1919, PER CENT OF
TOTAL IRON PRODUCED

	Per Cent
Iron consumed in steel works where produced.....	69
Iron purchased by steel works.....	<u>9</u>
Total iron used by steel works.....	78
Iron purchased by foundries.....	19
Iron produced by foundries for own consumption.....	<u>2</u>
Total iron used in foundries.....	21
Export of iron.....	1

* Based on *Census of Manufactures* data.

29 per cent of the iron was made by 11 establishments producing for sale only and averaging in output only 79,830 tons each. It is in this latter group, referred to as merchant pig-iron furnaces, that we find the members of the American Pig Iron Association. This association, whose reports of its members' production, shipments, and new orders are of great interest to us, claims approximately 77 per cent of the merchant capacity for 1919.⁶³ As a group, the merchant pig-iron makers, of which the Association must be considered fully representative, distributed their output as follows: 31 per cent sold to steelworks, 69 per cent to iron

⁶³ *Record Book of Business Statistics*, Part II, pp. 18, 19. The total pig-iron production of the members, recorded for 1919 as 6,041,402 tons, appears to be 68 per cent of the output of merchant furnaces as reported by the Census and 19.8 per cent of the country's total of 30,543,167 tons.

foundries. By a cross-classification of iron according to kinds, the Census reports that 78.5 per cent of all iron produced was either basic or Bessemer and that 19.3 per cent fell in the foundry and malleable classes. Thus it is quite clear that the merchant furnaces alone supplied nearly all the iron required by the nation's foundries and devoted the remainder of their output (31 per cent) to grades suitable for steelmaking. It is for this reason that we may look to the foundries and machine shops, as reflected in the Federal Reserve index of employment in the machinery group, for indications of the volume of demand placed upon at least two-thirds of the merchant capacity.

One of the first evidences of the unexpected revival in demand following the armistice was the increase in new orders for merchant pig iron which appeared at the end of February, 1919. By July 1, new business had increased sixteen-fold, and buying for 1920 delivery was dampened only by the refusal of ironmakers to accept business that far ahead because of price uncertainties. Some selling, however, was done. In mid-July a leading establishment opened its books for the first half at an increase of \$2.00 a ton over the March agreement levels of \$25.75 for basic or steel-making grades and \$28.15 for No. 2 foundry iron. Production during the first half of 1919 was such that backlogs were drawn down to about 2.8 months' work at the close of May, whence they rose steadily during the following 9 months.

The great steel strike considerably heightened the general shortage of iron, although it affected various groups of producers differently. Merchant stacks were relatively less hurt than those of steelworks. Merchant tonnage in September was slightly larger than in August, the last full month before the strike. The loss in October amounted to 16 per cent on the August base. December production was 15 per cent above that of August. The iron production of steelworks, on the other hand, was greatly crippled by the strike. September output fell 15 per cent below that of August, and October, 45 per cent below. Nor was recovery rapid, for the December figure was still below August by 13 per cent. In all, probably one month's smelting operations were lost and unfilled orders backed up by that length of time. Another consequence of

the strike was the territorial shift in demand to areas least hit. The eastern smelters appeared the beneficiaries. It was just at this time that the Ford Company undertook sizable plant enlargements, placing a 20,000-ton structural-steel order with the American Bridge Company, which simultaneously entered the eastern market for 45,000 tons of iron for immediate shipment.⁶⁴

Another result of the shutdown appeared in the diminishing supplies of spot iron. The market, like that for steel, was swept clean of stocks. Thus by the end of October, with deliveries set back a month, stock piles cleared away, and a coal strike just beginning, buying suddenly became intense, and consumers bid up prices "rapidly in their efforts to protect themselves against their requirements."⁶⁵ Order-books which had been opened in September for first-half business had nearly five months' smelting operations scheduled by October. In the Chicago area, mills, uncertain as to the amount of smelting that fuel and labor conditions would permit during the first half, closed their books to all but their regular customers. The shortage there was so acute that much iron was taken from southern districts which had been less damaged by the strike.

Famine conditions characterized the November pig-iron market for spot delivery; nor could the situation look more hopeful in the future. Restrictions placed upon the use of cars to facilitate the distribution of coal caught the smelters at both ends. The supply and price of coal and the hazards of delivering orders became serious deterrents to selling up to capacity for future delivery; prices stood on end. December told the same story, with the steelworks' stacks having a difficult time getting back into production. January brought a larger increase in new business than had ever been witnessed before, and by the end of February, 1920, more than eight months of smelting capacity was on the books. This is to be compared with an average of two and six-tenths months for the eight-year period, 1919-26. Throughout the first two months of 1922, prices could be almost anything smelters cared to name; demand far surpassed the tonnage smelters were willing to offer.

⁶⁴ *ITR*, October 2, 1919, pp. 877, 880.

⁶⁵ *Ibid.*, October 23, 1919, p. 1089; October 30, p. 1161.

In view of the behavior of prices over the succeeding eight months and the patent scarcity of pig iron, one may be led to guess that the excessive drop in March in the rate of new orders might have been due to the lack of unpledged furnace capacity rather than to any action of consumers. It is more likely, however, that the decrement was a real reflection of demands and had its origin in the fact that buyers, unable to get deliveries of new orders under eight months, felt too uncertain about their own markets further ahead than that. This notion finds support in the scrap market, a barometer customarily respected by the iron and steel trades. As new business fell off in March, steel-scrap prices weakened, and this behavior was a matter of considerable editorial surprise. In May new business again descended and scrap prices sagged. June, July, and August saw new business unchanged; scrap prices firmed and then advanced. If these two series were acting in harmony, how, then, shall one reconcile the tremendous drop of new business in September and October (80 per cent) with a September rise in scrap? The only plausible assumption, in view of the extreme scarcity of spot iron and correlative maximum prices in September, is that scrap, being available, was used in greater quantities.

The effects of the steel and coal strikes were cumulative, becoming more troublesome rather than less, even after work was resumed. The loss of production probably just removed the margin of supply which would have served the market and kept it in hand. The climax of this precarious condition came when the switchmen's unauthorized strike held up still further the few supplies that were moving. Scarcely a ton of coal or iron entered or left mill yards during the first few days of the strike; 55 furnaces, having about 17 per cent of the nation's capacity, were forced to bank immediately. Before two weeks had passed, the 46 active stacks in the Mahoning and Shenango district were reduced to 8. Coke prices, with which we shall deal in the next section, shot upward 250 per cent in the two months following, and this was on top of an earlier rise of 50 per cent. Spot iron brought as high as \$60 and \$65 in the east by April 20.

The supply panic, which is the most accurate way of describing this condition, lasted through May, June, and July, perhaps into

September. With prices mounting and markets scoured for iron, it may appear that new business had experienced a great renaissance. But this was not exactly the case. At least 300,000 more tons of production were lost in the spring and midsummer than the amount lost during the steel strike. The shortages had accumulated not only because production had been lost but because it could not be made up. Had ironworks been unhampered, their capacity would have answered the demand with comparative ease. Hence it seems clear that it was not a resurgent demand which sent iron prices upward but only a failure of production to supply the marginal requirements of those who could not do without.

An unusual, though not surprising, aspect of the situation just described was the emergence in August of overselling on the part of most furnaces.⁶⁶ All the furnace capacity was booked for the remainder of 1920 and much of it through the first half of 1921, the latter at prices ranging from \$43 to \$50. One is bound to speculate upon the consequences arising from the prevailing oversold condition of mills, had the demand continued unabated.

Though prices were strongly pressed to higher levels through August and part of September by consumers whose needs were imperative, signs of real contraction were not lacking. At the end of June a large amount of iron appeared for resale, having been offered by the Ford Motor Company "in addition to the excess of its own make." The consumption of foundry iron by the automotive trade was sufficiently large to endow events in that field with special significance for the merchant men. The frequency with which unoptimistic news originated among the automobile-makers had been increasing since May, and by the latter part of August the character of events could not be misread. Although it is not intended here to burden the automobile trade with the responsibility for bringing about the collapse of the iron market, still the part it contributed should not be lost sight of. Automobile cancellations appeared to be among the earliest in the avalanche which melted bookings away. Beginning in late August, the rail trouble cleared, and shipments of iron and steel were

⁶⁶ *Ibid.*, August 5, 1920, p. 349.

quickly lifted to high levels. By mid-September they were exceeding production by 15 per cent, and stocks were drawn down to two weeks' supply for foundry iron and one week's supply for basic. Buyers were readily at hand for suspended orders when cancellations first appeared in substantial numbers, but the rapid restoration of freight service soon provided iron to anyone who needed it. It was then that many discovered that their needs had not been so large as they had declared; 50 per cent of the backlogs disappeared before the year was out.

Employment in the machinery group dwindled slowly after July, the decline gradually gaining momentum as 1921 approached. The drop in September was large, and this was probably one of the principal factors in the collapse of the merchant producers. The swift descent of new business probably attests the quick shift from the practice of ordering in excess of, and far in advance of, optimistic estimates of needs, to that of filling the barest requirements in the spot market. It is likely that cancellations exceeded the amount necessary to bring consumers' orders into line with their real requirements. A great many of them, it is safe to say, were made for the purpose of securing lower prices. New business, for whatever cause, began its upswing in December, 1920, before the depression had got well under way. Production itself continued downward until July, 1921, and prices reached the first leg of a double bottom in August. Scrap, however, paralleled production. In explaining the spectacular recovery in new business, a very suggestive hint is found in the production of automobiles. Here the recovery began in January, 1921, the improvement being sufficient to carry production above average by June. It is quite likely that while pig-iron production itself was carried downward through July by waning demand from the machinery group, new business, though insufficient to reverse the trend, was originating with the automobile manufacturers.

COKE AND BITUMINOUS COAL

We have had many occasions to consider the effects of fuel shortages upon the iron and steel industries and their principal consumers. Although in 1919 iron ore accounted for 50 per cent

of the cost of materials for ironmaking and fuel (in the form of coke) for only 36 per cent, it is not venturing much to say that coke, in terms of restricting output and the general amount of harassment it caused producers during the chaotic year of 1920, was practically the only raw material of iron. For this reason our review of the iron and steel trades would not be complete without a report of the chain of events which brought to fuel one of the most spectacular supply-and-price eruptions in this period.

We may dismiss the role of ore with this observation: the transportation of ore suffered its quota of interruptions due to labor difficulties but at no time did a serious shortage appear; and the price, fully controlled, saw two changes, one to \$7.25 from \$6.25 in January, 1920, and the other in mid-year 1921 which brought it back to its earlier level.

In 1919, 466 million tons of bituminous coal, valued at \$1,146 millions, were mined. Coking plants, including those of establishments primarily engaged in other manufactures, consumed 64 million tons, only 14 per cent of the total mined. Blast furnaces, in turn, absorbed 78 per cent of the coke produced, an amount constituting 36 per cent of their total cost of materials. It might be noted, in addition, that steelworks and rolling mills consumed possibly one-half as much carbon as blast furnaces did, although there is no way to determine what proportion of it was coke and what coal.

With this brief indication of the quantitative relationships involved in the coal, coke, and iron industries, we may turn our attention to the progress of the coke market and, in so far as it touches the latter, the bituminous coal market also.

On September 24, 1917, the government set the price of coke at \$6.00 a net ton at the Connellsville (Pennsylvania) ovens, after it had run up to \$13.25 in the chaotic market preceding stabilization. Bituminous coal prices were set at an average of \$2.58 a net ton, but not until nine months later. Control was lifted in January, 1919, and the prices of both coal and coke worked lower until May, when the effects of a growing industrial demand reversed their course.

The possibility of a coal shortage did not appear just as the strike became imminent but was foreseen as early as July. Coa

operators were even then urging industrial consumers to stock up.⁶⁷ Three factors seemed to be at the base of their fears.⁶⁷ One was the possibility of a transportation breakdown. The other two were mutually dependent. The wage agreement then in force was to remain until the end of the coal year, April 1, or until the President's proclamation of peace, at either of which times new wage scales could be negotiated. The mine operators sensed the consequences if all three of these conditions should materialize at the same time. Their warnings were heeded substantially, though not fully. Coal output increased from August through October, and prices responded to the expanding demand.

As related in an earlier section, the bituminous coal miners struck on November 1. The order was withdrawn on the eleventh, but work was not resumed quickly, and November's output was cut in half. December was below average, and high production rates were not reached until the new year. Fuel Administrator H. A. Garfield restored wartime price controls in November and undertook the allotment and distribution of coal according to the new priority list made up at the end of October. Early in December the supply to beehive coking ovens was curtailed by 25 per cent; the resulting price rise of nearly 100 per cent in the three days following brought coke also under federal price control. On December 8 the price was fixed at \$6.00. This shortening of the beehive coal supply sorely injured the Pittsburgh iron and steel mills, inasmuch as they depended heavily upon coke supplies from the Connellsville region (typically a beehive-producing area and, importantly, by far the largest source of coke in the nation). The supply ruling was effectively reinforced by requisitioning cars for coal-distributing service elsewhere. Production losses were estimated at 65,000 tons weekly in the Connellsville region and 100,000 tons for the whole country.⁶⁸ We have noted at other points the upward propulsion of iron and steel prices resulting in part from real, in part from feared, shortages of metal which the curtailed supplies of coke brought about. By-product ovens in the Connellsville area were also rationed. The Coal Distributing Committee decided to allow them sufficient coal to operate at 50 per cent, but there was no assurance that enough coal could be

⁶⁷ Cf. *IA*, July 14, 1919, p. 456.

⁶⁸ *ITR*, December 4, 1919, p. 1489.

found.⁶⁹ At the year's end the yield in this important section was at the lowest rate since 1910.

With the termination of the strike, which was officially brought to an end in Indianapolis in mid-December, and the re-establishment of normal rates of production at the beginning of January, the government eased its coal restrictions somewhat. But a curious combination of factors remained to plague everyone connected with coke. The specific allotments of coal became more liberal, but the number of coal cars could not be enlarged by edict, and the number in the service of the priority groups could not be significantly altered since the coal shortage, now essentially a matter of maldistribution, was still acute. In short, the fuel problem had become a transportation problem. Nevertheless, coke supplies were far short of meeting requirements. Although the price was nominally fixed at \$6.00, no coke changed hands at that price in the spring.⁷⁰ Finally, when the physical amount of coal appeared sufficient at least to safeguard the nation's health, government control was removed on April 1, 1920. Released, official quotations and reportable transaction prices ascended vertically in one of the most astounding market developments to be found in the industrial field during this period. Then the railroad strike, bringing traffic paralysis to an industry already gasping for cars, administered the coup de grâce to what remained of reasonableness. Bituminous coal prices jumped 370 per cent in less than five months, coke prices advanced 300 per cent. At Boston, in July, beehive coke was delivered at \$24.90, in St. Louis at \$25.00. At the Connellsville ovens spot prices prevailed at \$20.00 to \$21.00 for much of July and the first few days of August. An interesting contrast to these figures is reported by the Federal Trade Commission: the average cost of coke produced in ovens belonging to the U.S. Steel Corporation during the first half of 1920 was \$4.19 a ton.⁷¹ This contrast clearly shows how far out of hand the market had become after the fuel-distributing committee had yielded its function to the guidance of prices.

⁶⁹ *Coal Age*, December 25, 1919, p. 952.

⁷⁰ *ITR*, February 12, 1920, pp. 471 ff.

⁷¹ *Report of the Federal Trade Commission on Wartime Profits and Costs of the Steel Industry* (Washington, 1925), p. 108 (U.S. Steel costs at plants selected at random).

The collapse of coal and coke prices was simultaneous and as sheer as their ascent. When the traffic situation, as it uniquely affected coke, suddenly improved in the first and second weeks of August and coke began to move at a rate 25 per cent better than July, the frantic market clamor subsided, inquiries fell off, and buyers waited for price concessions. The "squeeze" was over. Those who feared that they would be unable to cover their categorical needs were assured. The needs of others had just passed or were passing. And so between them the market fell. The cumulated shortage of fuel is attested, if further evidence is needed, by the vast amounts loaded for shipment in the three months of August, September, and October. This consumption further reveals the relative persistence or endurance of needs long unsatisfied, in view of the fact that it took place on a disintegrating price structure. Nevertheless, cancellations reached a great volume and buyers withheld shipping instructions pending price adjustments on orders which were not suspended outright.⁷²

The impact of the fuel shortage upon the course of the iron and steel trade cannot be determined with precision, although the loss of production directly assignable to the lack of fuel obviously was large. On the other hand, it is likely that the intensification of demand, prompted by the urge to be covered on raw materials (which resulted in ordering in advance and in excess of needs) placed a fictitious cap on the crest of the boom. But the contracts which buyers and sellers entered in response to or on the basis of the fiction were real; hence the disintegration of normal business channels, the breaking of contracts to escape losses, the losses resulting from the partial completion of orders which were not to be accepted, became more widespread, only to increase the momentum of the collapse.

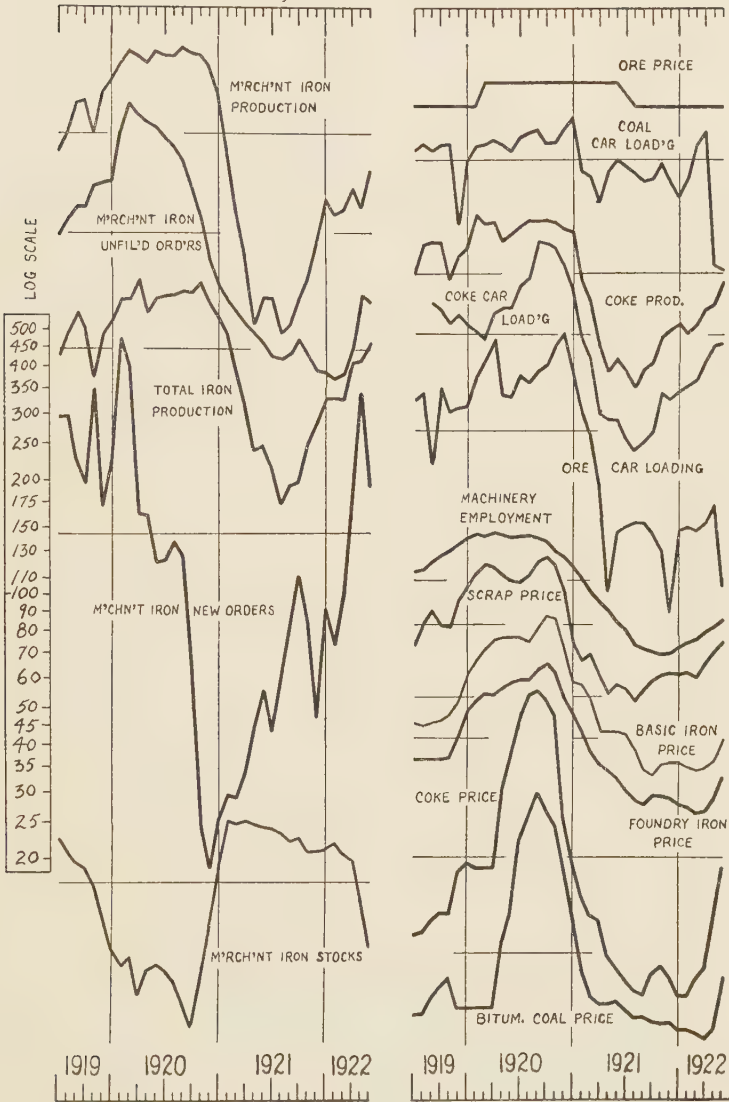
⁷² *ITR*, January 5, 1922, p. 73.

THE IRON, COAL, AND COKE INDUSTRIES

- Merchant pig-iron production. Adjusted for seasonal. *Iron Age*.
- Merchant pig iron, unfilled orders, end of month. Not adjusted for seasonal. American Pig Iron Association.
- Pig iron, total production. Not adjusted for seasonal. *Iron Age*.
- Merchant pig iron, new orders. Adjusted for seasonal. American Pig Iron Association.
- Merchant pig iron, stocks at merchant furnaces, end of month. Adjusted for seasonal. American Pig Iron Association.
- Iron ore, Mesabi, Bessemer. U.S. Bureau of Labor Statistics, index of wholesale prices.
- Coal, car loadings, average per day. Adjusted for seasonal. American Railway Association, Car Service Division.
- Coke, by-product and beehive, production. Adjusted for seasonal. U.S. Bureau of Mines.
- Coke, car loadings, average per day. Adjusted for seasonal. American Railway Association, Car Service Division.
- Iron ore, car loadings, average per day. Adjusted for seasonal. American Railway Association, Car Service Division.
- Machinery, factory employment. Adjusted for seasonal. Federal Reserve Board.
- Scrap. *Iron Age*, monthly average of prices at Pittsburgh, No. 1 heavy melting steel.
- Pig iron, basic, price in eastern Pennsylvania. American Iron and Steel Institute.
- Pig iron, foundry No. 2. U.S. Bureau of Labor Statistics, average of weekly prices at Pittsburgh.
- Coke. *Iron Age*, average of spot prices, Connellsville.
- Bituminous coal. *Coal Age*, average of spot prices at mines.

CHART X

THE IRON, COAL AND COKE INDUSTRIES



CHAPTER VI

AUTOMOBILES

THE automotive industry deserves special attention, partly because of its leading position as a consumer of metal products but more particularly because of its strategic position in the industrial community. It is difficult to draw a line where manufacturing for the automotive trade begins, still more difficult to find the limits of its pervasive influence. Not only is it a prodigious consumer of materials, but its influence on standards and practices is well-nigh incalculable. Our treatment of the industry will be limited to a review of some of the growth factors and to the production difficulties and financial aspects of the trade in 1920.

The close relationship of the automotive industry to the iron and steel industries is roughly indicated by the quantities of metal it consumes in the production of cars alone. In 1919 one finished car consumed:

200 lbs. steel bars and billets
113 lbs. steel springs
500 lbs. steel sheets
100 lbs. alloy steel
630 lbs. malleable and foundry pig iron
1,543 lbs., 913 of steel; 630 of pig iron ¹

According to this tabulation, the manufacture of automobiles in 1919 absorbed:

27.0 per cent of the total output of black steel sheets, 13-gauge and less ²
3.5 per cent of the total rolled finished steel
10.6 per cent of the total foundry and malleable pig iron

¹ *ITR*, January 6, 1921, pp. 45-49.

² According to the Census classification, sheet consumption reached only 19 per cent; but the Census, classifying by gauge only, includes a considerable amount of what the trade would list as plates.

It is doubtful whether these figures are large enough to represent the full amount of iron and steel in each car, especially in 1919, 1920, and 1921, when wood was rapidly being displaced by metal. This growth of metal consumption was vitally important to the iron and steel industry, especially in 1921 when the automobile manufacturers returned to the market early and vigorously. In that year they increased the proportion of total iron and steel consumed over their 1919 proportions as follows: total rolled finished steel, 40 per cent; steel sheets, 48 per cent; foundry and malleable iron, 77 per cent. It was estimated that in the eighteen months following July, 1919, the use of foundry and malleable iron in automobile castings caused an increase in the capacity of that field amounting to more than 25 per cent. Of course, we are here talking only of the metal entering the car itself; we have said nothing of the vast quantities required to build up productive capacity. In all probability this can never be measured, because one cannot determine where the expanding waves of influence have their termini. In addition to the enlargement of automobile plants as such, there results a train of enlargements in the capacities of plants supplying parts, which in turn relays a considerable demand to still others. By what conversion factor we should have to multiply a given increase in automobile-plant capacity to obtain a measure of the additional wealth being brought into service we have no way of knowing. In a survey of automobile-makers' plans for 1920 the editors of *Automotive Industries* reported that "alterations and additions that will permit of doubling and trebling factory output is the rule."³ Ford planned the production of 1 million cars that year. In Detroit, building construction amounting to \$60 millions was started or planned by the automotive and allied industries on January 1, in addition to the \$40-million blast-furnace project of the Ford Company.⁴ The financial plans of the leaders in the field are impressive, even now. General Motors had just voted a capitalization of \$1 billion, which made it the largest corporation, excepting U.S. Steel, in the country. Three months earlier it had entered the tool market, for \$2 or \$3 million worth of tools. In the following June, plans which would

³ January 5, 1920, p. 283.

⁴ *ITR*, January 1, 1920, p. 55.

make the Pontiac machine shops the largest in the world were made known, as well as plans for doubling the output of trucks. In June, 1920, the Mercer plants likewise announced their intention of doubling their rate of production. Packard in May began to increase its facilities through an \$11-million project, which would bring up the number of its employees from 10,000 to 15,000. These instances are in themselves an impressive indication of the vitality with which the industry was growing. The effects upon allied and supplying industries can only be guessed.

The rate of automobile production more than doubled during the twelve months beginning February, 1919, which brought the output for the year substantially above the previous banner year of 1917, the major difference being that the public, not the government, was doing the buying. How long and to what extent the production curve would have continued to climb is an interesting speculation. The fuel, materials, and transportation difficulties which befell producers in other lines struck the automobile trade even harder and brought more financial complications. In the closing months of 1919 production failed by 20 per cent, it was estimated,⁵ to meet its schedule, because steel deliveries fell short. The assignment of railroad cars to facilitate the distribution of fuel left the automobile-makers with only 50 per cent of their normal supply in February, 1920. Of course, automobiles, unlike billets, could be driven away; and, in the crisis which followed, an increasing number of them were. Against a normal average of 10 per cent, 40 per cent were driven away in January; in March and April the proportion had risen to 78 per cent and 80 per cent. But all cars could not be so distributed, and by April 1 the National Automotive Chamber of Commerce reported that in the Detroit area there were 15,000 cars valued at \$21 millions (borrowed to finance this business), awaiting railroad-car service.⁶

The fuel-transportation crisis enveloped the automobile-makers, pincers-like. On one side, there was the credit problem, to which we shall return in a moment; on the other side, there was a drastic cut in production. The April rail tie-up had immediate

⁵ *Automotive Industries*, December 25, 1919, p. 1284.

⁶ *Ibid.*, April 1, 1920, p. 829.

repercussions. In Indianapolis motorcar- and equipment-makers closed down. The Maxwell plant at Newcastle suspended. In Muncie parts establishments 5,000 men were out of work. In the great Detroit area the shutdown was almost complete. Lacking fuel, the Detroit Edison Company, upon which most factories depended for power, quickly restricted service in favor of civilian and emergency requirements, forcing an estimated 100,000 automobile workers into idleness. The Packard Company, which had its own power facilities, exhausted its fuel supply on April 17 and had to suspend. On the nineteenth the Detroit Edison Company restored industrial power service to the extent of 40 per cent, thus permitting about half of the automobile employees to resume work on the basis of four- and five-hour shifts.⁷ Allowing for seasonal variations, auto production in April fell 40 per cent below that of January. In May, even though better production rates were recorded, they were still 35 per cent under National Automotive Chamber of Commerce schedules.

While production schedules were showing progressively larger deficiencies, February through April, the number of automobiles stored and awaiting car service for shipment nevertheless mounted dangerously. It was this circumstance which resulted in considerable embarrassment from the financial angle—a factor which, while not originating in the transportation difficulties per se, was very much a part of the general picture when measured by results. The 15,000 automobiles awaiting transportation in the Detroit area at the close of March, 1920, represented a credit total of \$21 million, which could not be liquidated. Just at this unfortunate moment the Kansas City banks, acting on recommendations made by the Kansas City Federal Reserve Bank, began to restrict the paper of loan companies financing motorcar purchases.⁸ The Kansas City Federal Reserve Bank declared that automobile paper was undesirable for rediscounting and in the week of April 19 declined approximately \$3 million of it. The policy of the Federal Reserve Board on limiting credit to “essential” transactions was cited by the Kansas City Reserve Bank in

⁷ *Ibid.*, April 22, 1920, pp. 982 and 985.

⁸ *Ibid.*, April 8, 1920, p. 882.

ruling that pleasure passenger cars were nonessential and therefore undesirable for rediscounting privileges.⁹ When the situation was brought to the attention of the governor of the Board, Mr. Harding defended the action of the Kansas City Bank by reiterating the Board's policy and declaring that each bank was privileged to act autonomously.

In the meantime the railroad strike had sharply augmented the stock of unshipped automobiles, and the automotive trade was in the midst of a serious credit crisis. The editor of the leading trade journal wrote:

Bank credits have become the two most important words in the vocabulary of every businessman. . . . They are nowhere more important than in the automotive industry. . . . The period of readjustment has arrived. . . . The big New York banks are optimistic. They do not expect a panic, even in Wall Street.¹⁰

The editor then cited the position of the Federal Reserve Bank on May 7, when it declared: "Clearly the present is not an appropriate time to extend business merely for the sake of increased volume of profits. Nor is it a time for public or private improvements not absolutely necessary for health and efficiency."¹¹

The pressure on automobile paper was not confined to the Kansas City Federal Reserve Bank (where local conditions explain the rather uncomfortable position that bank was in anyway). It quickly spread to the East, principally in upstate New York and in the fifth Federal Reserve district around Richmond. How most finance companies finally got out of the crisis is mainly a story of local arrangements. However, one important instance of defensive action taken by a centralized command at the top was that of General Motors in doubling the capitalization of the General Motors Acceptance Corporation.

The extent to which financing difficulties destroyed the market for automobiles is not known. After May, 1920, very little was heard of the trouble; and, if we may judge by the consumption of gasoline, the demand for automotive transportation revealed no subsidence. In fact, the most that can be said of the course of

⁹ *Ibid.*, April 29, 1920, p. 1036.

¹⁰ *Ibid.*, May 13, 1920, pp. 1093-94.

¹¹ *Ibid.*

demand for this kind of transportation is that it increased continuously from February, 1919, through 1922, with only a leveling-off in the increment in the first half of 1921.

After a low point in production had been passed, probably around May 15, 1920, output mounted steadily through June and July, possibly through August (depending upon what index of seasonal variation is used in adjusting the production series). The purchase of materials for the automobile trade tapered off during the latter part of July and the beginning of August. The sheet market, after it had passed the stage of frantic bidding by the automobile-makers in the spring, continued strong until its complete demoralization was brought about by the disappearance of automobile-buying after the end of July. During July, however, news was excellent. Detroit production was at the maximum permitted by materials. On July 22 the Ford Company, which had been on a schedule of 3,000-3,500 cars per day, announced that its rate beginning August 1 would be 4,000. But during August practically all branches of the iron and steel trade saw demand from Detroit vanish and requests for suspensions take its place.

At several points in our narrative the automobile trade has had an important place in discussions concerning the destruction of the several markets for steel. The cumulative effect of this association is the impression that consumer demand for automobiles was such that in mid-August, 1920, the automobile-makers suddenly ceased to need steel and, withdrawing their orders, precipitated the collapse of the steel markets. Superficially this is so; but the onus must not be put upon the automobile trade; the responsibility should be charged to the improvement of transportation facilities.

In the first two weeks of August, 15,000 coal cars were released from coal-distributing service elsewhere and became available to the coke, iron, and steel industries (see above, p. 191). Steel products flowed forth in abundance, and buyers no longer needed to fear being unable to fulfil their requirements. Hence the eager bidding for the insufficient supplies which had characterized the ferrous markets for ten months naturally evaporated. In the light

of this circumstance we may now look at some of the experiences of the automobile manufacturers.

The crest of consumer demand for new automobiles probably placed new orders at peak levels in December, 1919, and the first two months of 1920. Unfilled orders were probably at their crest in April, more the result of crippled production than the rate of new orders. Under normal conditions it would be possible to determine approximately when the demand for automobiles gave way by referring to production figures. The same figures would also disclose the manufacturer's need for steel and iron. The 1920 figures, however, need careful interpretation.

Employment, usually a reliable indicator of turning-points in production, turned downward in the automotive industry in February, 1920, and continued to lose ground by a nearly constant percentage throughout the remainder of the year. Production, however, showed an interestingly different pattern. Between January and April, 1920, output fell by 40 per cent, whereas employment lost only 12 per cent. It is usual for output figures to fluctuate more than employment, following either an upturn or a downturn; but the disparity is not often so great as it was in this case. Hence it would seem that factory forces were being held intact as much as possible, occasionally on part time, in anticipation of conditions which would permit greater output. In May, when the extreme crisis in traffic paralysis had lessened, production turned upward and climbed through August, relatively crossing above employment in July. Sometime late in August production again turned downward and by the end of the year exactly coincided with employment (relatively, using January, 1920, as a base in both series). This is a revealing relationship; while it does not show the exact amount of production lost in the January-April period for want of supplies, it does show that it was considerable. In the May-August period the implications are clear. The upswing in production, it may be reasoned safely, was the result of acquiring additional materials and was itself more a measure of the loss due to earlier shortages than an improvement in consumer demand. In short, it was the working-off of unfilled orders at a rate determined by the supply of materials.

The behavior in August of buyers for the automobile trades, like that of buyers for all steel consumers, was simply and solely a response, market-wise, to radically changed conditions of supply. That the buyers disappeared, no one will doubt; and thus their action may properly be said to be associated with the collapse of steel markets. But their action was precipitated by the correction of a condition which had harassed them for ten months and not by conditions originating within their own industry.

The depression in the automotive industry was extremely short. Like other consumer goods, its low point at the year's end was followed by an upsweep in the first half of 1921 which carried production to average levels.

CHAPTER VII

BUILDING AND ALLIED INDUSTRIES

NO RECORD of the post-war cycle would be adequate without some reference to the building and allied industries. This section is included, therefore, not with the intention of closely examining the course of the markets for domestic and industrial housing, but for the purpose of bringing this important branch of economic activity into our general picture of the period.

During the war the use of building materials was greatly restricted. Early in 1919 the deficiencies in private building began to be made up, and contracts soared to pre-war records. But the new vitality was not long lived. New contracts let for residential building (square feet) turned downward in August, 1919, commercial building in November, and industrial construction (value) in February, 1920. The descent in all three categories was swift and did not halt in the case of dwellings and commercial buildings until December, 1920, and in the industrial class until March, 1921. Not only was the drop swift; it reached catastrophic proportions, the loss amounting to 84, 80, and 91 per cent, respectively.

The recovery in the residential and commercial classes was also swift, particularly for the former, which had gained 165 per cent by May, 1921. Industrial construction, on the other hand, recovered more slowly. After gaining 120 per cent in two months following its low point, it lost the entire gain in the succeeding four months. This retardation would seem to be in accord with the great expansion of plant capacity which we noted everywhere during the year following May, 1919. Patently, additional capacity was not required in most fields until consumption rates got into the area above normal. In this connection we may notice that consumer demand did, indeed, rise quickly into that area after 1920. In the case of shoes, clothing, automobiles, and now

new dwellings, consumption rates were at or above average by June, 1921. In October of that year, the letting of contracts for industrial projects turned upward—at just about the same time that employment in the great machinery group improved.

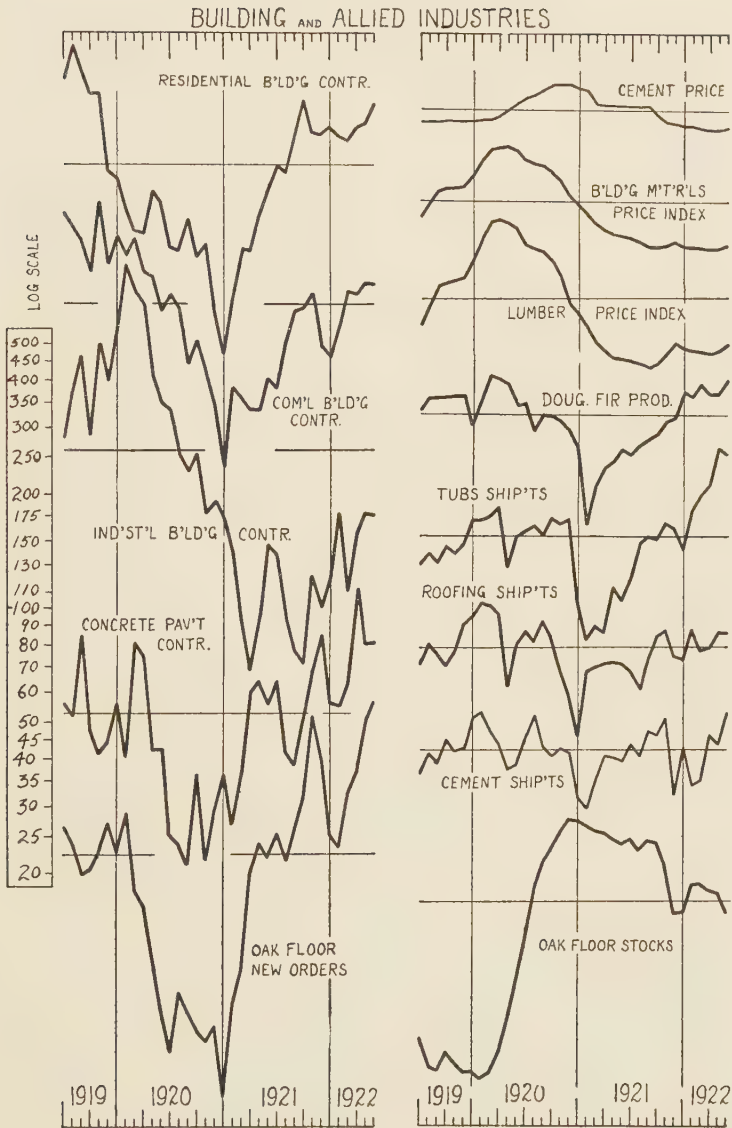
We may now look briefly at some of the allied industries, such as lumber, cement, brick, and plumbing fixtures, which depend partly or in whole upon construction activity for their business. Among these products for which we have records of new orders—oak flooring, terra cotta, bathtubs, sinks, lavatories, and enamel sanitary ware—there is almost perfect correspondence with the course of building contracts. Inventories of the latter four classes of products reveal the pressure of building demands. Stocks were drawn down as building contracts mounted and continued downward as the work of construction increased, even after the rate of new contracts had plummeted. Shipments of these plumbing fixtures, however, follow no self-consistent pattern. Generally shipments were heavier in the second half of 1920 than in the first half. The transportation difficulties show up in all four classes of products, and all suffered the year-end collapse noted particularly in steel products. The year 1921 was one of general recovery for all of them. At about the time that transportation facilities cleared, inventories began to accumulate—or to be built back to normal working levels. This occurred slightly earlier than what appeared to be the maximum rate of distribution and continued until the third quarter of 1921, by which time distribution had recovered all the ground previously lost. Inventories then began to sink back again as new contracts and building activities forged into prosperity levels.

The production of lumber followed a curve approximating that of building-work. The amount of lumber cut and employment in sawmills rose throughout 1919 and persevered at high levels until April or May, 1920. Recovery in production coincided with the upturn in building contracts, and, very probably, building activity, in the very first months of 1921. Lumber prices surged upward from early 1919 through March, 1920, where they hesitated for two months before falling sharply as consumption in building projects gave way.

BUILDING AND ALLIED INDUSTRIES

- Building contracts awarded, residential (square feet of floor space, 27 states). Adjusted for seasonal. F. W. Dodge Corporation.
- Building contracts awarded, commercial (square feet of floor space, 27 states). Adjusted for seasonal. F. W. Dodge Corporation.
- Building contracts awarded, industrial (value, 27 states). Adjusted for seasonal. F. W. Dodge Corporation.
- Concrete-pavement contract awards, total, square yards. Adjusted for seasonal. Portland Cement Association.
- Portland cement. U.S. Bureau of Labor Statistics, index of wholesale prices at plants.
- Building materials. U.S. Bureau of Labor Statistics, index of wholesale prices.
- Lumber. U.S. Bureau of Labor Statistics, index of wholesale prices.
- Douglas fir, lumber production, board feet. West Coast Lumbermen's Association.
- Bathtubs, shipments, number of pieces. Adjusted for seasonal. Enameled Sanitary Ware Manufacturers Association.
- Prepared roofing shipments, square feet. Adjusted for seasonal. Prepared Roofing Manufacturers Association.
- Portland cement, shipments, barrels. Adjusted for seasonal. E. F. Burchard, *Geological Survey* through 1920; thereafter Bureau of Mines.
- Oak flooring, new orders, board feet. Adjusted for seasonal. Oak Flooring Manufacturers Association of United States and Southern Oak Flooring Industries.
- Oak flooring, stocks, end of month, board feet. Adjusted for seasonal. Compiler: see oak flooring, new orders.

CHART XI



Face-brick production rose to a high peak in January and February, 1920, from which it speedily receded, losing ground throughout the balance of the year and the first three months of 1921. Recovery brought it back to prosperity levels as early as June, however.

The experiences of the cement industry are not so clearly in harmony with the bold unanimity found in the other building and allied industries. Its production, shipment, etc., series deviated irregularly from what would appear to be the course of construction demand. Employment increased from early 1919 through December, 1920, but fell in the succeeding two months more sharply than at any other time. It promptly recovered about half of the loss; and this level was preserved into January, 1922, whence it spurted again to above-average levels. Cement shipments, if we may draw upon our knowledge of the conditions existing in railroad transportation, made up, in June and July, 1920, quantities lost in the preceding four months and then tapered off to a low in January, 1921, from which they quickly recovered to normal levels. Production, on the other hand, showed only a January-February peak in 1920, corresponding with other building-supply industries, and a January decline in 1921, the latter accentuated by the unaccountable, continuous rise in output in the latter half of 1920. Prices, too, not made in a market one should wish to define as free, show a curious behavior when compared with building materials generally. An imperceptible rise from March, 1919, through February, 1920, gave place to a substantial upward slope which carried practically to the end of the year. A sharp drop in February, 1921, to levels obtaining in the previous June brought a stabilization which held prices at that level until September, 1921, when a slow decline set in. A considerable portion of the total demand for cement arises from modern road building; and orders, pouring in from this quarter, arrived at an opportune moment for cement manufacturers in 1920-21. Contracts awarded for concrete pavements diminished during the boom period but were increased rapidly after August, 1920, thus initiating the great road-building program which brought in its wake far-reaching changes in the patterns of community and national economic life.

CHAPTER VIII

RECAPITULATION

STRIPPED of details and concessions, the main outlines of business experience following the first World War are relatively clear. The depression which everyone expected to result from the termination of "war business" promptly materialized; and, although records subsequently showed it to be a very minor recession, ending about March, 1919, it was not the kind of a setting wherein anyone was inclined to call for deflationary action. Any policy which aided the re-employment of the service personnel and prevented the deterioration of domestic and foreign markets was deemed a good policy. Expansive market developments both at home and abroad were not long in the making.

On the domestic-market front an unexpected condition emerged. Released from the fear and economy of war, a huge unsatisfied consumer demand began to assert itself. Slowly at first and then with increasing momentum the buying wave engulfed the staple commodities and swept on to the luxury lines, unstemmed by the mounting price barriers hurriedly thrown in its path by sellers.

Meanwhile, demand-making forces on the foreign-market front were active. Our government made huge post-war credits available to European nations for the purchase of American goods. In addition to the goods acquired under these terms, a formidable quantity was paid for by the shipment of gold, the export of goods, and by credits privately arranged in this country. No small portion of this unprecedented demand was due to the purchasing power which European currencies enjoyed in America as against their home markets because of the temporary disequilibrium between exchange rates and purchasing-power parities. By June, 1919, the quantity of goods exported was at an all-time peak.

The unanticipated resurgence of consumer demand at home and the unexpected demand from Europe, aided by billions in credit and the unsuspected operation of a then unfamiliar mone-

tary phenomenon, caught producers unprepared to deliver the astonishing volume of goods called for. By fall, 1919, American plants, operating at practical capacity, were unable to keep up with new orders, and additional plants and equipment were ordered built. Industry suddenly found itself short of all raw materials. With insufficient plant capacity and raw materials, output was allotted and delivery dates put forward by months, in some cases a year. Bona fide orders could find no takers. Prices, freed from wartime control, stood up to what the traffic would bear.

While these conditions were developing rapidly, matters in the banking field were not moving in a way calculated to produce stability. Congress wanted to curb the skyrocketing prices but continued to appropriate funds and authorize additional bonds to cover the deficits. The Treasury, having no choice but to do Congress' bidding, maintained its wartime control over the Federal Reserve System and hence over the banking machinery of the nation. War paper, carried to investors through the banks, enjoyed such preferential rediscount rates and privileges as to obliterate the Federal Reserve eligibility classifications. Hence, as production materials became progressively scarce, the prospect of still higher prices induced buyers to accumulate goods—speculators for the likelihood of profits, purchasing agents against the probability of yet greater needs. Credit for these operations (as well as for the regular needs of a nation at full productive capacity) was abundantly available in the rediscount of war paper, which the Federal Reserve, though opposed to the abusive use of its facilities, was powerless to halt.

Before the distribution of the final Victory Loan was completed and the Reserve System freed from Treasury domination in January, 1920, the volume of credit in use had expanded nearly to the limits of the legal reserve ratio. Meanwhile, retail stocks were built up as rapidly as wholesale deliveries and consumer taking would allow. Buyers all along the line from retailers to raw-material processor placed oversized orders not with one but with several suppliers in the ardent hope of covering actual needs with something to spare.

The manner in which this inflationary spiral was reversed is distressingly simple. The consumer, protesting against rising prices, brought on the downturn by withdrawing from the markets. This "buyers' strike" did not burst full blown upon a startled nation. "Buy Nothing" clubs were in evidence as early as August, 1919, and the movement gained increasing momentum as the winter deepened. January, February, and March saw it at near-peak intensity, but in April the passive resistance was at its meridian. The singular condition which enabled the consumer to take price matters into his own hands in the United States and not in Europe was that goods were actually plentiful here, whereas abroad they were not and the consumer was forced to part with his last note far short of filling his modest wants.

Although the consumer was the prime mover in this episode, the forces released by his concerted action were not the only ones at work. With an interrelatedness that is lost in the separate telling, events in the banking, foreign-trade, transportation, manufacturing, and distributive fields hurriedly completed the destruction of the post-war boom.

Our government shut off credit to Europe for purchases in the United States. European exchange rates, released in the spring of 1919 from the artificial levels at which they had been pegged, had generally reached purchasing-power-parity levels by the end of the year, thus extinguishing the advantages which European funds enjoyed in American markets. With deteriorating exchanges, private financing of American exports became increasingly hazardous. This development in conjunction with difficult credit problems at home rapidly diminished new buying for foreign account during the first half of 1920. In May, Japan was forced by her crisis to cancel a formidable share of her American orders.

At home, new industrial buying fell off at about the same time that consumers withdrew from their markets. But unfilled orders, current business, plants and machinery in process of construction, and the transportation tie-up delayed the fall of physical production for a considerable time after the forces of contraction had set in.

Superficially, March, April, and May, 1920, presented a contradictory picture. Beginning in December when the government allocated coal by priority groups and later by coal-car-service allotments, the railroads gradually bogged down under their extraordinary burden, until the unauthorized strike of freight handlers and switchmen completed the paralysis in April. Trainloads of credit-using goods—raw and semifinished materials, merchandise—clogged the freight yards and sidings without unloading. Wholesalers and manufacturers, pressed for time, recklessly bid for critically scarce on-hand supplies—hence the curious paradox of insatiably urgent markets after contraction had already set in. The effective forces basically at work were these: The nonliquidation of freight-stalled goods piled additional credit needs upon a banking system already pressed to the legal limit. Moreover, credit demands were now addressed to a changed Federal Reserve. Newly divorced from the Treasury, the Reserve Board not only pressed its fight against the misuse of borrowed funds but had in addition undertaken to reduce the net amount of credit outstanding.

A pathetic by-product of the buyers' strike and the rail tie-up was that merchandise arrived too late to catch the ebbing sweep of consumer demand. The cancellation evil had broken out in March, when multiple, oversided orders had begun to be withdrawn. Now goods themselves were either refused or returned on the excuse of broken delivery dates. The bulk of the cancellations, however, grew out of managers' reappraisal of the immediate future; and no small liability for the violence of the transition from prosperity to collapse may be assigned to the quick reversal from ordering in advance and in excess of needs to buying on a hand-to-mouth basis.

The interdependent operations of forces springing from the breakdown in transportation, the added demand for credit superimposed upon that which had stretched the facilities to the limit, the new direction in Federal Reserve policy, the obstacles to financing foreign trade, the spread of cancellations, and the reversal in ordering practices—all conjoined to bring the business structure down hard in the last half of April and in May, 1920.

If a crisis may be said to have overtaken business after the war, this was it.

The depression in heavy capital goods did not get under way as promptly as in the consumer industries. Though many plans for expansion in plant and machinery were abandoned, the projects in process could not be so easily shut off. Curiously, the prices for the heavy capital goods' principal raw materials—iron and steel products—did not give way until the latter part of August, when the railroad situation was corrected and goods flowed forth to ease the critical shortage.

From May in the consumer-goods industries and from August in the heavy-goods industries the descent in production was swift and the deterioration of the markets complete. By the end of 1920 the nation's economic life was thoroughly demoralized and inert.

It may be stated with confidence that it was again the consumer who brought about the recovery by returning to his markets in December, 1920, and January, 1921. This is literally so; he returned to the retail shops after absenting himself for nearly six months. The revival of the consumer industries promptly followed, and slowly recovery spread to the entire system. There were several conditions which enabled the new consumer action to have such a leverage upon the rest of the system.

The sharp depression and catastrophic collapse in prices had not seriously diminished consumers' savings (savings accounts increased during the depression). And at the lower price level the consumer's command over goods had been enormously increased. In addition to this factor it is apparent that there remained a great unsatisfied consumer demand which had not been fulfilled up to the time that the "buyers' strike" had sent prices tumbling. And once prices were descending, consumers, like purchasing agents, delayed purchases on the prospect of still lower prices.

The condition of retail stocks was also such as to relay the effects of consumer behavior to the rest of the system with magnified force. On the eve of the collapse, stocks had been expanded—in some cases doubled—and retailers all but suspended new buying until these could be worked down to the levels appropriate to

the current consumption. Hence the production shutdown in consumer industries was probably more drastic than the decline in the rate of consumption. Conversely, the sheer rise in production may be in part attributed to the retailer's effort to bring his stocks again into line with consumption rates. It should be noted that the consumers' influence upon production stopped, temporarily at least, with the consumer-goods industries. The "equipment" industries, tools, machinery—in short, producers' goods and their principal raw materials—continued their downward course until the consumer industries had ascended approximately to average production rates—July, August, and September, 1921. Which is only to say that subnormal production rates required very little new equipment.

Besides returning to his markets for typical nondurable goods, the consumer expressed other and cyclically far more important demands—those for housing and for automobile transportation. The demand for new housing reasserted itself in December, 1920, and quickly brought the great building industry back into normal operations. The recovery stimuli emanating from this source escape appraisal because of their very pervasiveness. Equally far-reaching in its effect upon general recovery was the sharp revival which the consumer brought to the automotive industry. By the end of the war, automotive transportation had won a definite place in the consumer's world; and the demand for it, judged by gasoline consumption, scarcely abated during the depression. The vast network of enterprise which this new industry brought with it—road building, accessory, fuel, repair, and service facilities and the means of their production, in addition to the extra capacity called upon to furnish the raw materials and tools for the production of automobiles alone—was one of the true novelties of the era. Much has been made of this phenomenon as the innovation which brought the nation out of its post-war depression. This is not strictly accurate, for it is apparent that the downswing was terminated in a manner which would have operated without the automotive industry. Yet the momentum which this industry—this "way of life" is almost an appropriate term—imparted to the system carried the recovery along at much higher levels than

would have obtained otherwise. A great share of the rehousing of the country which took place in the decade following the war may be attributed to the enabling possibilities of automobile transportation.

Although it has been given as our opinion that the consumer brought on the downturn by withdrawing from his markets in protest against the mounting cost of living, there are elements in the picture which offer basis for other conclusions.

It may be noted that downturns in retail sales (and on this matter data are pitifully meager) did not always, or even generally, precede downturns in the other integral segments of the same industry. One of the important residual impressions of this study is the raggedness, the unevenness, with which the various sectors of an industry reached their turning-points apparently without reason, logic, or, as between industries, uniformity.

This lack of reasonable orderliness reveals a large gap in our knowledge of business responses. When one thinks of the organization of an industry, from raw material to consumer, he is likely to assume that those entrepreneurs with the least shiftable risks would be the most wary of changes affecting their interests. Yet, as far as our records will permit generalizing, they were not often the first to alter their course. On the other hand, those entrepreneurs whose operations are generally protected by hedges were sometimes the first to change. Curiously, the retailer, closest of all to the consumer, appeared least aware of what was taking place. During the upward prosperity spiral he multiplied his stocks, placed multiple, oversized orders, and, generally, was the least sensitive to the mounting ground swell of protest. But, when finally the crest overtook him, he was the most panicky. He deserted the wholesale markets, dumped his goods in genuine sales, canceled his orders, and returned those which had arrived.

The temporal irregularities in the turning-points of the various sectors of an industry may be due, in part, to the organization or conventions of the markets which carry the goods forward. For instance, where one producer manufactures to stock, his successor may be able to adjust his own rate of operations by reference to his own new orders and backlog. Whatever temporal discrep-

ancies remain, after allowing for the subtleties of the conventions in the succession of markets in an industry, may be fairly ascribed to a lag in market knowledge on the part of entrepreneurs.

But allowance for specific marketing conventions is not enough to close the temporal gap between the downturns of certain manufacturers and retail sales. Shall we then conclude that the entrepreneurs (excluding the retailers) brought on the depression by accurately forecasting what the consumers were about to do? Whatever manufacturing rates may have been and whatever prices may have prevailed in the markets—and it is clear that either of these may have been preserved for some time after those responsible for them had concluded that a reaction was in progress—the personal *beliefs* of business managers about the outlook in their own industry might be assumed to be fairly well reflected in the amount of stocks of materials which they deemed it wise to have on hand. In almost every instance stock changes heralded downturns in their own industries. This behavior might point to a relationship which may or may not be confirmed by the better statistical records of succeeding years. At the upturn the relationship was not so uniform.

Of course, there is the possibility that the decrease in stock piles may have been uniquely associated with actual goods shortages in 1919 and 1920. On logical grounds, however, this decrease seems very closely connected with the varying lengths of time that manufacturers want to be covered on raw-material requirements. Needless to point out, changes in the rates of purchase of goods having 60 per cent of the value of all goods manufactured in the country have far-reaching repercussions in the general tempo and outlook of the economy. A rapid foreshortening of forward commitments must, of necessity, weaken markets and engender, in turn, a still livelier urge toward hand-to-mouth purchasing. A general lengthening of forward contracts creates the atmosphere which produces more extension.

The writer is inclined to the view that in 1919-20 manufacturers of consumer goods did anticipate downturns in their respective industries and had begun to take precautionary steps considerably in advance of declines in the consumption of their prod-

ucts. Actual levels of production and prices, however, were preserved by the unwary retailers. The fundamental question left for explanation, therefore, is: What caused the manufacturers to change their minds about the outlook in their respective markets? The available evidence seems to point to the following answer: The consumer-resistance movement, while gaining momentum, was not strong enough until February, March, and April, 1920, to counterbalance the marginal increase in consumer buying power. Meanwhile, the manufacturers were becoming more impressed with the vocal, articulate, organized protest of the consumers (and the government) than with their increased money income. Seeing that goods currently in process would reach the consumer at still higher costs (prices), the manufacturers were evidently persuaded that the buyers' resistance would dominate the retail markets.

This interpretation, while undertaking to name the principal element thought to have shaped the entrepreneur's outlook, certainly does not exclude the presence of other prime-moving forces operating independently to bring about a contraction. As a matter of fact, almost every economically respectable force which has been offered by business-cycle theorists can be detected at work in the collapse of 1920-21. All that we have claimed is that the consumer brought on the downturn and that consumer-goods manufacturers, turning downward in many cases ahead of consumption, did so more in fear of the consequences of the growing consumer resistance than in response to other factors which were visible at the time.

With respect to the capital-goods industries, the pattern of business responses is clear. Given the downturn in consumption rates, projects in the planning stage were abandoned, work was halted on those just begun, while the rest, too far along to abandon, were completed. Attention was called earlier to the fact that these industries declined until the production of consumer goods had remounted to average levels, whereupon new equipment was called into use.

